MAINTENANCE MANUAL

Harmony LA™ Surgical Lighting and Visualization System

(06/22/05) **P764330-226**

A Word From STERIS Corporation

ADVISORY

The operation and maintenance procedures recommended by STERIS® are described in this manual. Only these recommended maintenance procedures should be followed.

A listing of the safety precautions to be observed when operating and servicing this equipment can be found in Section 1 of this manual. Do not operate or service this equipment until you have become familiar with this information.

Any alteration of this equipment not authorized or performed by STERIS Engineering Service which could affect its operation will void the warranty, could adversely affect sterilization efficacy, could violate federal, state, and local regulations, and could jeopardize your insurance coverage.

INDICATIONS FOR USE

The Harmony™ LA Surgical Lighting and Visualization System is a variable pattern, variable intensity surgical lighting fixture designed to provide visible illumination of the surgical field or the patient for the operating room staff.

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Printed in U.S.A.

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Section 1: Listing of Safety Precautions

The following *Safety Precautions* **must** be observed when operating or servicing this surgical lighting system. WARNING indicates the potential for personal injury and CAUTION indicates the potential for damage to equipment. For emphasis, certain *Safety Precautions* are repeated throughout the manual. **It is important to review ALL *Safety Precautions* before operating or servicing the unit.**

Strictly following these *Safety Precautions* enhances your ability to safely and effectively utilize the unit and helps the customer avoid improper maintenance methods which may damage the unit or render it unsafe. It is important to understand that these *Safety Precautions* are not exhaustive; customers are encouraged to develop their own safety policies and procedures to enhance and compliment these *Safety Precautions*.

WARNING – ELECTRIC SHOCK AND BURN HAZARD:

- Disconnect all utilities to lighting fixture before servicing. Do not install the lighting fixture unless all utilities have been properly locked out. Always follow OSHA Lockout-Tagout and electrical safety-related work practice standards. (See 29 CFR 1910.147 and .331 through .335.)
- Do not remove covers or perform service other than as described in this equipment manual. Refer servicing to qualified service personnel. (Maintenance Manual P764330-226.)

WARNING – EXPLOSION HAZARD:

- Do not use lighting fixture in the presence of flammable anesthetics.

WARNING – PINCH AND CRUSH HAZARD:

- Do not pinch fingers between the structural plate and the vertical tube as the assembly is lifted.
- The safety ring must be installed.
- Pinch points are created during extreme articulation of the suspension system. Do not place hands on or near the suspension knuckle during lighthead articulations.

WARNING – IMPACT HAZARD:

- Do not remove tension screw from the spring arm joint until the lighthead has been securely installed onto the spring arm. Note: This warning applies at both installation and de-installation procedures.

WARNING – PERSONAL INJURY HAZARD:

- Do not attempt to replace the lamp unless power is turned off and the lighthead has cooled sufficiently.
- Do not attempt to clean lighthead unless power is turned off and the lighthead has cooled sufficiently.
- Do not remove monitor-arm safety pin until monitor is installed.
- Monitor extension arm must have monitor (or equivalent counterweight) installed to keep arm in required positions while installing sliding guards.
- Avoid looking directly at high-intensity light, whether at the lamp or directly at the lighthead. Eye injury may result.

WARNING – POSSIBLE PATIENT INJURY HAZARD:

⚠ Failure to engage the lighthandle cover completely may result in cover falling from lighthead during the procedure.

WARNING – BIOHAZARD:

⚠ Sterile disposables are intended for single use only.

⚠ Universal precautions must be observed when disposing of any single use disposable item.

WARNING – DISPOSAL HAZARD:

⚠ This product contains materials which may require disposal through appropriately licensed and permitted hazardous waste management firms.

CAUTION – POSSIBLE EQUIPMENT DAMAGE:

⚠ Use of any disinfectant solution OTHER than those listed below may cause discoloration or deformation on the polycarbonate lens surface: Coverage® Spray HBV, Coverage® HBV Concentrate, T.B.Q.®, or Coverage Plus®, Coverage™ Spray Disinfectant Cleaner, or Germicidal Cloth. Cleaning solutions other than those listed have NOT been tested for compatibility or effectiveness. Always follow manufacturer instructions for concentrations and use of cleaning products.

⚠ Use only recommended cleaning/disinfecting and/or anti-static agents on this light. Some degree of staining, pitting, and/or discoloration could occur if a phenolic-, iodophor-, or glutaraldehyde-based disinfectant is used on the surfaces of this light. Also, use of alcohol or aerosol spray cleaner/disinfectants (e.g., Lysol®) containing a substantial amount of alcohol in the formula can damage the polycarbonate lens.

⚠ Prevent leakage of fluids into interior of lighthead.

⚠ Avoid discoloration of control center keypad and display. Do not clean control center with Betadine® solutions or allow such solutions to contact keypad and display surfaces.

⚠ Do not scratch optical coating on accessible portions of optic assembly when cleaning; always wear rubber gloves and use only a clean, white, lint-free cloth when wiping internal surfaces.

⚠ Appropriate components of this lighting system have been tested and found in compliance with IEC 60601-1-2 (1st Edition 1993-04), Medical Electrical Equipment – Part 1: General Requirements for Safety; Electromagnetic Compatibility (EMC). There is, however, a potential for electromagnetic or other interference between this equipment and other devices. Should you experience interference, relocate this device or minimize the use of the affected equipment while this device is in operation.

⚠ Do not touch the glass portion of the lamp with bare fingers. Skin oils can cause deterioration of material leading to possible failure of the lamp.

⚠ Accurate measurement and calculation in finding the point where the first hole is drilled for the safety ring is of critical importance in correctly installing the vertical tube. Check all measurements and calculations twice before drilling the first hole.

⚠ Do not pinch wires that exit the vertical tube as the assembly is lifted. Gently route wires from the vertical tube out of the way as the suspension system is lifted into place.

CAUTION – POSSIBLE EQUIPMENT DAMAGE (Continued):

- Do not pinch wire on the ceiling structure or vertical tube.
- During all mounting steps, ensure wires are not pinched between mechanical components of suspension, spring arms, or lightheads.
- Harness connectors must be slipped into expandable sheathe before routing through monitor yoke.
  - Failure to use sheath may cause connector damage during routing.
  - Slip sheathe only far enough onto the harness to protect connector bundle. If sheathe is slipped too far onto the harness, removing it after routing may be difficult.
- Do not touch glass portion of lamp with bare fingers. Skin oils can cause deterioration of material leading to possible failure of the lamp.
- Sliding guards may be damaged if not installed properly into internal grooves.
- On early light systems, the wire clamp must be loosened to allow the wiring within the vertical tube to be free.

1.1 DEFINITION OF SYMBOLS

Symbol	Definition
	ON
	STANDBY
	Lamp Out
	Protective Earth (Ground)
	Attention, consult manual for further instructions
	Hot
SER. NO.	Serial Number of Unit
V~	Voltage Rating of Unit, Alternating Current
A	Amperage Rating of Unit
Hz	Frequency Rating of Unit
+	Increase Intensity (Surgeon's Control Buttons)
-	Decrease Intensity (Surgeon's Control Buttons)
	Zoom
	Rotate
	Manual Focus
	Auto Focus

Section 2: General Information

The product literature included in this section contains factual data relating to the principal characteristics of the Harmony™ LA Surgical Lighting and Visualization System.

The literature is informative rather than instructional. It provides and conveys, through text and illustrations, a general concept of the equipment, its purpose, limitations, and technical applications.

2.1 GENERAL DESCRIPTION

The Harmony LA Surgical Lighting and Visualization System is a variable pattern, variable intensity surgical lighting fixture designed to provide visible illumination of the surgical field or the patient for the operating room staff.

2.2 HARMONY LA 300/500/700 LIGHTHEAD OPTICAL PERFORMANCE

Important: Values are typical for the small pattern size at highest intensity setting (unless otherwise noted) at 39-3/8" (1m) from the lighthead. Definitions and measurements are in accordance with IEC 60601-2-41.

Table 2-1. Lighthead Performance Data

	Harmony LA 300	Harmony LA 500	Harmony LA 700
Central Illuminance (range for intensity settings 1-7)	2,180 – 5,500 fc (23,500 – 59,000 lux)	5,480 – 13,470 fc (59,000 – 145,000 lux)	5,480 – 14,860 fc (59,000 – 160,000 lux)
Pattern Size			
D_{10}	8" (200 mm)	6 –11" (150 – 280 mm)	6 –13" (150 – 330 mm)
D_{50}	4" (100 mm)	3 – 6" (80 – 150 mm)	3 – 6.5" (80 – 165 mm)
Depth of Illumination	> 60" (> 1520 mm)	43" (1090 mm)	36" (910 mm)
Peak total Irradiance	< 250 W/m^2	< 700 W/m^2	< 650 W/m^2
Color Temperature	4,400 K	4,400 K	4,400 K
Color Rendering Index (CRI)	94	94	94
Shadow Control			
Single Mask:	0%	31%	56%
Double Mask:	66%	43%	47%
Cavity:	100%	100%	96%
Single mask w/ cavity:	0%	32%	51%
Double mask w/ cavity:	68%	44%	44%
Average Lamp Life at mid-range intensity	1,000 hr.	1,200 hrs	1,200 hrs

2.3 SPECIAL CONSUMABLES

Table 2-1. Special Consumables

Part Description	Part Number
Touch-up Paint – 2 Fl.oz	R001801-141
Installation Instructions, Standard Mounting	P129382-396
Installation Instructions, Harmony LA 500 Mobile Floor Stand	P129382-280
M.M. DeepSite	P764330-210
Installation Instructions Harmony DeepSite Mobile Floor Stand	P129382-281
Operator Manual, Harmony LA 500	P129382-106
Pre-In-Service Check List, Harmony LA 500	P764330-529
Uncrating Instructions, Harmony LA 500	P129382-395
Sterile Cover, Harmony LA Light Handle Camera, Single Pack, 8/Box	LB60-00
Plastic Lighthandle	LB20
Lighthandle Cover (Sterile, Single Pack; 10 to a pack)	LB41
Monitor Handle Cover (Sterile, Single Pack; 20 per case)	LB70
Flat Panel Monitor Handle Cover (Sterile, Dual Pack; 20 per case)	LB71
Harmony LA 500/700 Lamp	LB11
Replacement Lamp for Mobile Stand DeepSite Illuminator	LB12

Section 3: Operating Instructions

3.1 GENERAL INSTRUCTIONS

The wall-mounted Harmony™ LA Control Center allows the user to adjust the lighthead intensity level (brightness) by pressing a membrane switch (or "button"). An identifying number on the control display corresponds to the same number on the lighthead suspension arm. Additionally, each lighthead has its own "onboard" intensity controls, located on the above the lighthandle adjacent to the lens. These controls are usually referred to as the surgeon's control buttons or as the surgeon's control. (See Figure 3-2.)

3.1.1 To Adjust Lighthead Intensity Levels:

⚠ WARNING-EXPLOSION HAZARD: Do not use in the presence of flammable anesthetics.

1. Press ON touch pad.
2. Intensity levels for one or two lightheads can be controlled from one control center. A lighthead's surgeon's control buttons adjust the intensity level for that lighthead.

Important: Avoid control center faults. Do not continuously press and hold any control center buttons for more than 15 seconds.

3.1.2 Control Center

⚠ WARNING-EXPLOSION HAZARD: Do not use in the presence of flammable anesthetics.

See Figure 3-1.

1. Use the "Select Light" touch pads to move the display indicator up or down until it aligns with the appropriate lighthead.
2. Once the lighthead is selected, press either the button to increase light intensity level, or the button to decrease light intensity level.
3. If "All Lights" is selected, intensity for all lightheads in the system is increased or decreased simultaneously.

NOTE: For longer lamp life, use lowest intensity level suitable for surgical procedure.

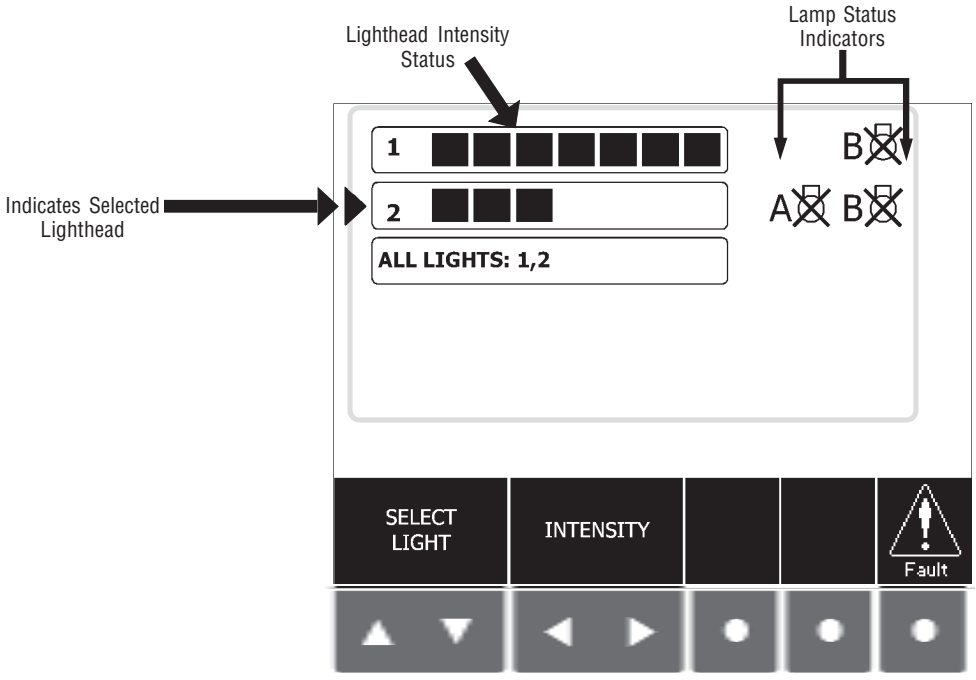


Figure 3-1. Harmony Control Center Main Menu

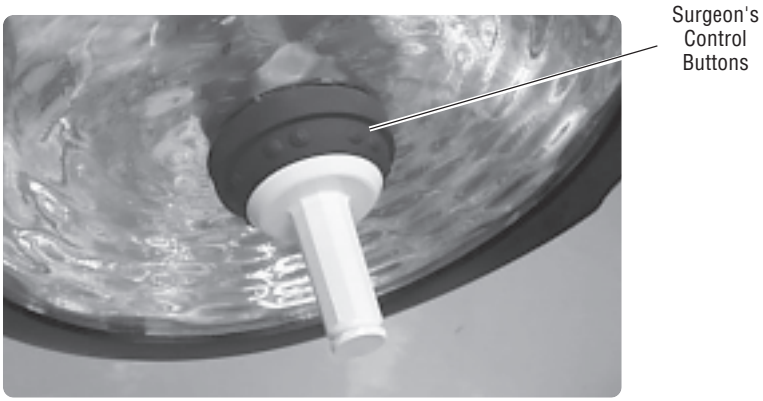


Figure 3-2. Lighthead Surgeon's Control Buttons (Harmony LA 500 Lighthead with Standard Handle Shown)

3.1.3 Surgeon's Control Buttons (See Figure 3-2)

1. Grasp the handle of the appropriate lighthead. A ring of membrane buttons (bumps) are located on the control bezel adjacent to the lighthead lens.
2. Press any of the surgeon's control buttons molded with "+" symbols to increase the lighthead intensity. Press any of the surgeon's control buttons molded with "-" symbols to decrease lighthead intensity.

   NOTE: For longer lamp life, use lowest intensity level suitable for surgical procedure.
3. To turn lighthead OFF.
   a. At the control center: press the "Select Light" button until indicator points to the appropriate lighthead on the display. Press the "Decrease Intensity" button until the light goes out.
   b. At the lighthead, press and hold any of the "-" membrane buttons untilthe light goes out.

      NOTE: Press the decrease intensity button (-) on the lighthead surgeon'scontrol for an additional 5 seconds, to turn off all lightheads in the system.

3.2 HARMONY LA 500 LIGHTHEAD LAMP FAILURE INDICATIONS

The main display screen on the control center indicates lamp status for the system lightheads. The display indicates the status of both the primary and secondary lamps for each lighthead. A failed lamp should always be changed at the earliest opportunity.

A Lamp Status LED is located on the lighthead (see Figure 3-3). If this LED is flashing, it indicates that the lighthead is using the backup lamp and the primary lamp should be replaced.

Check the lamp status LED each time the surgical light is used.

A secondary lamp inside Harmony LA 500 lightheads automatically turns on when the primary lamp fails.

If the lamp status LED is blinking, replace the failed lamp(s). (See Lamp Replacement, Section 6.) After the lamp is replaced and power restored to the lighthead, the primary lamp lights, the LED stops blinking and the graphic display changes to "lamp ready."

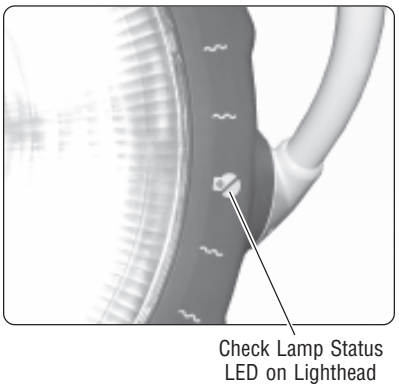


Figure 3-3. Lamp Status LED

3.3 HARMONY LA 300/500/700 LIGHTHEAD POSITIONING

⚠ CAUTION: Do not bump lightheads into walls or other equipment.

Lightheads can be positioned by using either the sterile handle, or by grasping the non-sterile handle around the lighthead housing. The following two paragraphs describe the positioning characteristics of the lighthead from outside or within the sterile field. To optimize shadow control, position the lighthead as appropriate before starting the intended surgical procedure.

Lighthead may (1) rotate continuously around vertical suspension tube; (2)rotate continuously around central hub; (3) rotate continuously about suspension arm; (4) tilt forward or backward in yoke approximately 310°; and (5) move up or down by pivoting at suspension elbow 15° up, and 85° down until vertical tube and suspension arm describe a straight line.

Monitor arms are capable of the following articulations: (1) rotate 300° at the central or secondary spindle; (2) rotate 330° at the horizontal extension arm; (3) rotate 320° a the yoke transition; (4) move up or down by pivoting at spring arm knuckle 20° up, and 40° down. Flat panel yoke also allows (5) tilt forward 15° or backward 75° in yoke. Additionally, the flat panel yoke can be rotated for either portrait or landscape display. See Figure 3-4.

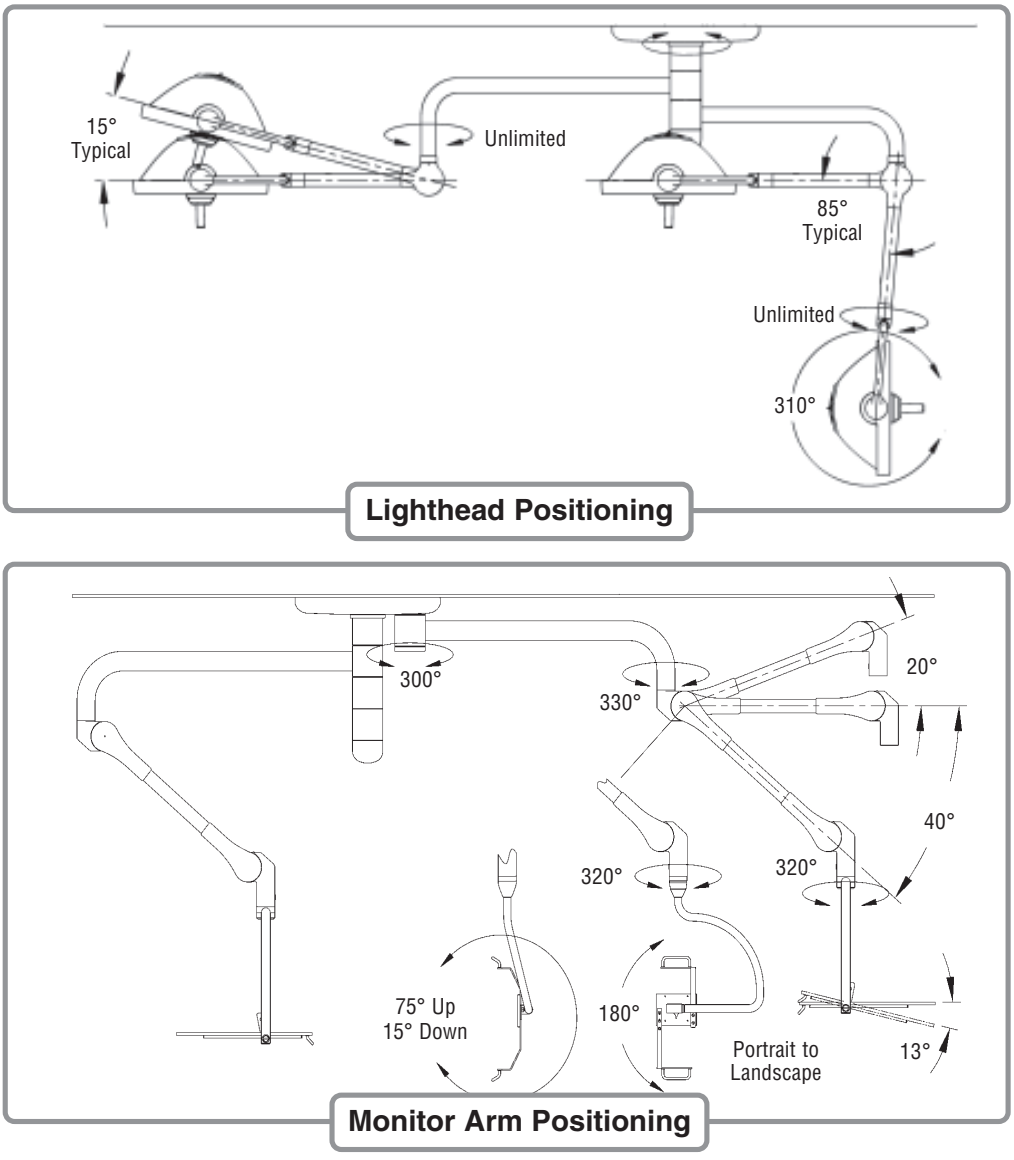


Figure 3-4. Suspension Positioning

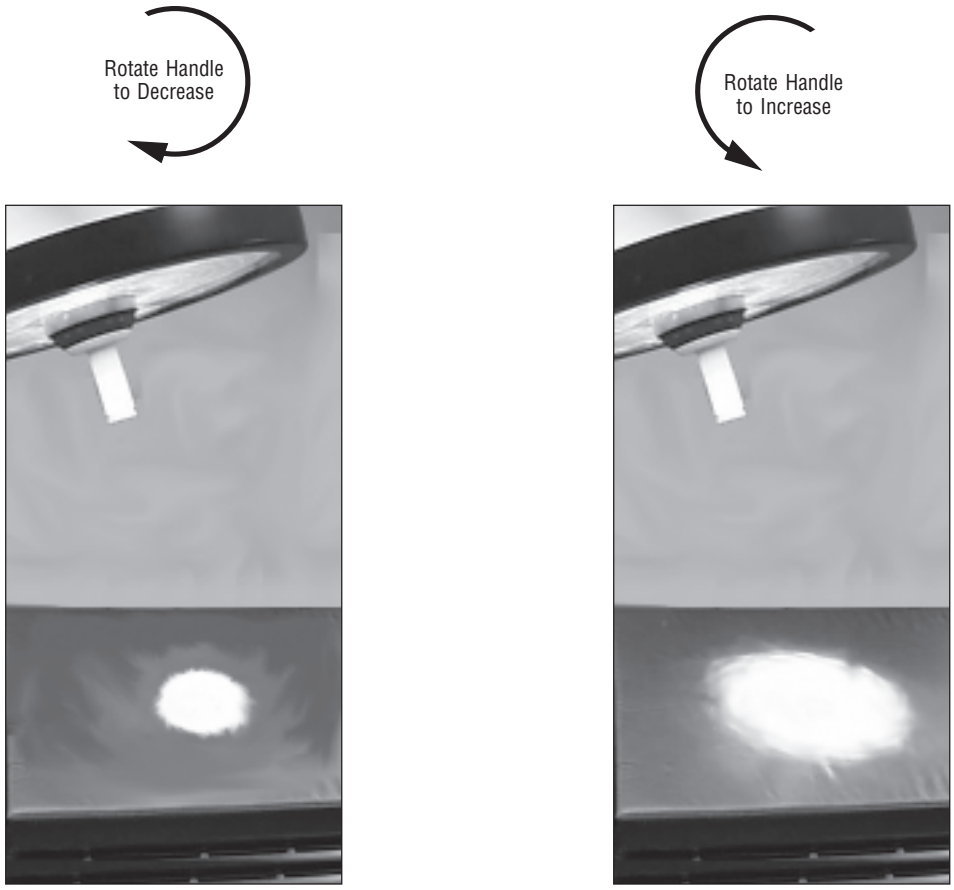


Figure 3-5. Light Pattern Adjustment

3.4 HARMONY LA 500 LIGHTHEAD PATTERN ADJUSTMENT

The illumination pattern for each lighthead can be adjusted to any diameter between the minimum and the maximum.

Adjust the light pattern by rotating the lighthandle clockwise to decrease pattern size.

Rotate the handle counterclockwise to increase pattern size.

NOTE: Typical lighthead positioning is above and slightly behind the surgeon's right or left shoulder.

3.5 LIGHTHANDLE AND LIGHTHANDLE COVER

3.5.1 Installing and Using Lighthandle and Lighthandle Cover

⚠ WARNING – POSSIBLE PATIENT INJURY HAZARD: Failure to engage the lighthandle cover completely may result in cover falling from lighthead during the procedure.

Lighthandles are used to position Harmony LA 500 lightheads, allow access to intensity control on each lighthead, and to adjust lighthead pattern size. To

avoid accidental contact with the non-sterile surgeon's control buttons, the lighthandle should always be used with a disposable, sterile lighthandle cover (available separately from STERIS®).

- If the lighthandle adapter is not already in place, align the tab on the adapter with the channel in the mounting ring and thread the adapter in until fully engaged. (See Figures 3-6a and 3-6b.)
- Prior to starting a procedure, ensure that the lighthandle is in place. Install the lighthandle by threading onto the adapter and firmly tightening. (See Figure 3-6c.)
- Remove the sterile lighthandle cover from its packaging and install onto the lighthandle. (See Figure 3-6d.)
- To ensure the lighthandle cover remains in place during the procedure, the groove in the cover must be fully engaged with the groove in the lighthandle.
- The lighthandle can be removed for cleaning or sterilization by unscrewing it from the handle adapter. The lighthandle can be sterilized using standard hospital cycles. Do not use the lighthead during a sterile procedure unless a disposable cover is installed on the lighthandle.

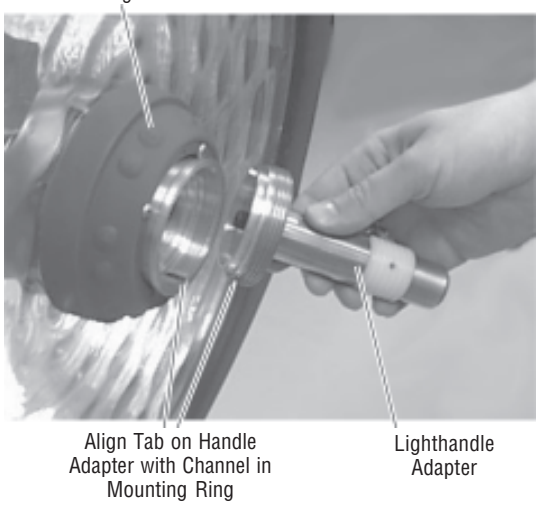


Figure 3-6a.

Figure 3-6b.

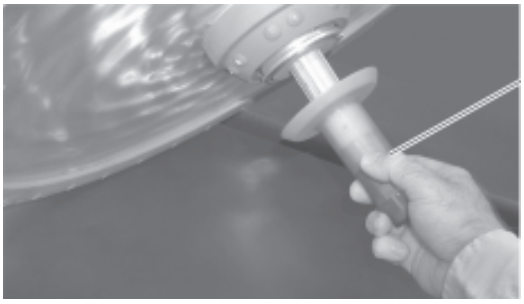


Figure 3-6c.

Figure 3-6d.

Figure 3-6. Standard Lighthhandle

3.5.2 METAL STERILIZABLE HANDLE

WARNING-STERILITY ASSURANCE HAZARD: Do not use the surgeon's control buttons unless a disposable sterile cover is installed. If the sterilizable lighthandle (metal) is used without a disposable cover, the surgeon's control buttons are not protected by a sterile covering.

The metal sterilizable handle is used to position the Harmony LA lighthead and to adjust the light pattern size. The sterilizable handle may be used in place of a disposable sterile lighthandle cover.

The plastic lighthandle should be removed prior to installing the metal sterilizable handle. To do so, simply unscrew it from the threaded handle adapter.

Prior to starting a procedure, install a clean, sterilized metal handle by screwing it onto the threaded handle adapter. Ensure handle is firmly tightened prior to use. The gap between the flange on the metal steriliizable handle and the surgeon's control buttons prevent accidental contact with the non-sterile surface of the buttons.

The metal sterilizable handle can be removed for sterilization by unscrewing it from the adapter.

The metal sterilizable handle can be sterilized using standard hospital cycles steam cycles intended for lumens. Always sterilize handle between surgical procedures.

Flat Panel Montior Support Arm with Monitor in Landscape Position

Flat Panel Montior Support Arm with Monitor in Portrait Position

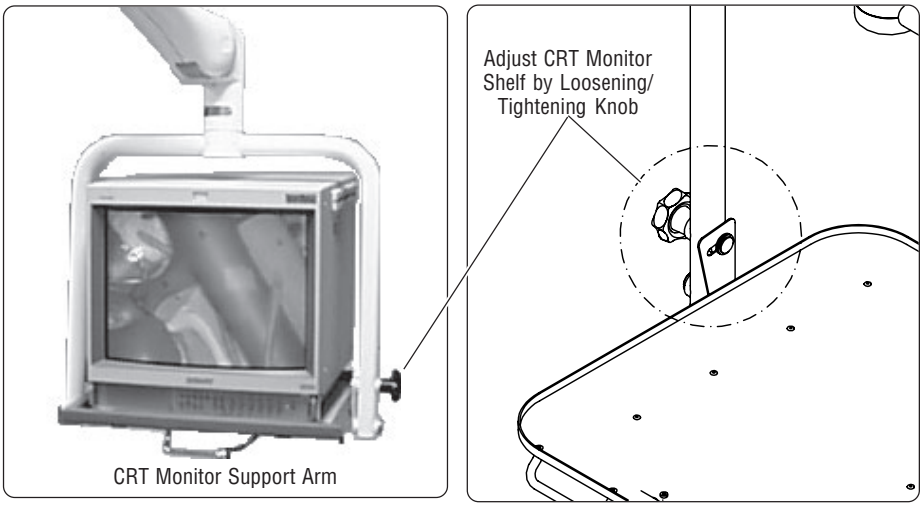


Figure 3-7. Harmony Monitor Configurations

3.6 HARMONY LA MONITOR ARMS

The Harmony LA Surgical Lighting and Visualization System can be equipped with one or two monitor supportarms. Monitor arms can be included in the Harmony system either as the uppermostarm on the central spindle, or as the secondary spindle arm.

Refer to *3.3 Harmony LA Lighthead Positioning* for positioning range details. See Figure 3-4.

Refer to separate Operating Instructions supplied with the monitor.

Signal and monitor power wiring is provided at the installation with each monitor support arm.

Input signals to monitors can be routed through the suspension wiring froman external video source (not by STERIS).

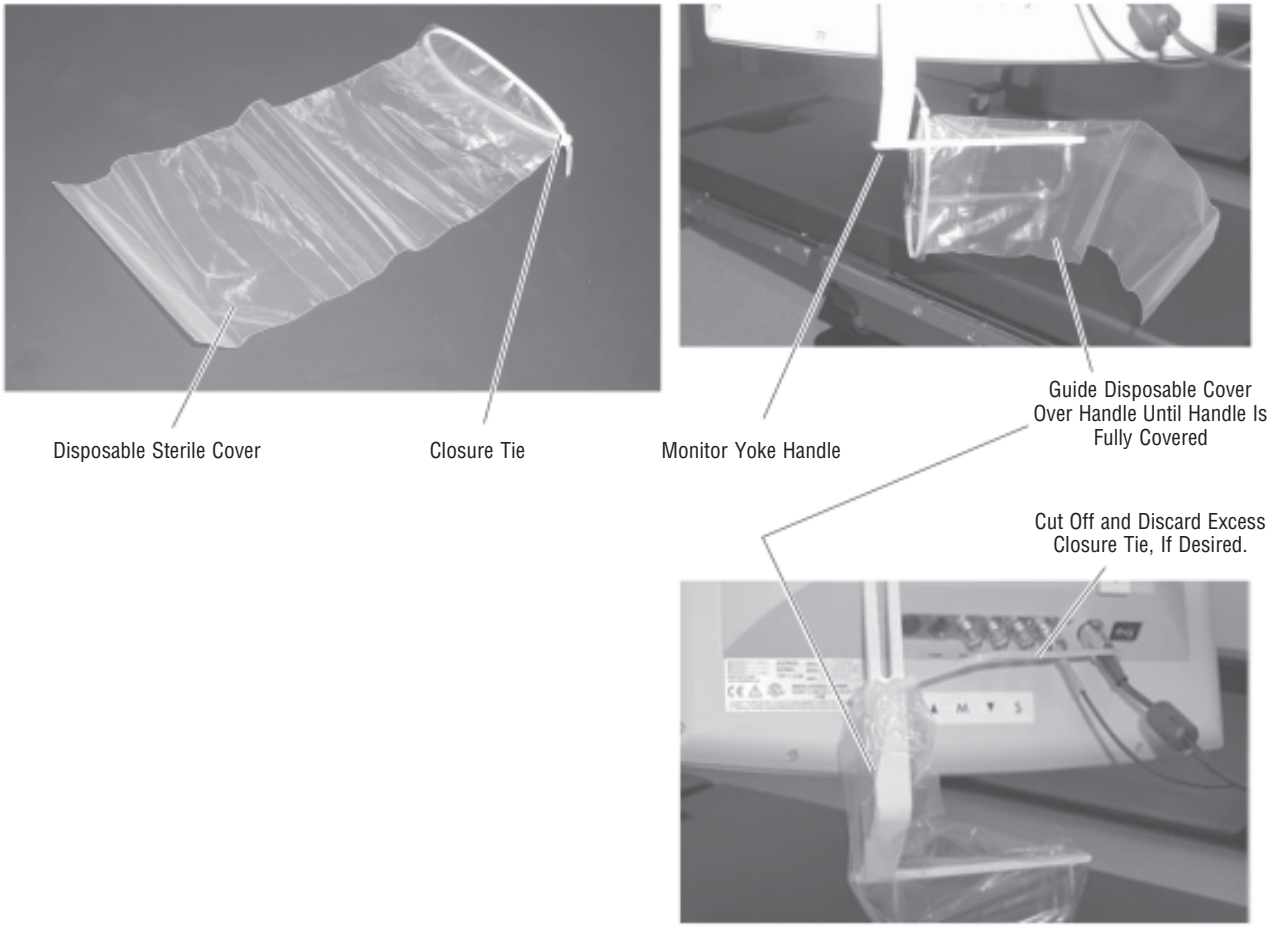

Disposable Sterile Cover
Closure Tie
Monitor Yoke Handle
Guide Disposable Cover Over Handle Until Handle Is Fully Covered
Cut Off and Discard Excess Closure Tie, If Desired.

Figure 3-8. Installing Disposable Sterile Monitor Handle Covers

3.7 INSTALL FLAT PANEL MONITOR YOKE HANDLE DISPOSABLE STERILE COVERS

⚠ **WARNING – BIOHAZARD: Sterile disposables are intended for single use only. Universal precautions must be observed when disposing of any single use disposable item.**

Important: Use new covers for each handle for each procedure where the monitor will be used. Covers are sterile and shipped in a protective wrapper. Wear sterile gloves when removing covers from packaging. When installing covers, follow sterilityassurance procedures as outlined by facility protocols.

Refer to Figure 3-8.

1. Remove cover from packaging.
2. Pull the cover until it fully covers the handle.
3. Pull closure tie until tight enough to prevent cover from slipping down the handle.
4. Repeat procedure for second handle.

3.8 VIDEO CAMERA INSTALLATION OR REMOVAL

3.8.1 Installation

1. Rotate lighthead until lens faces the room ceiling.
2. Remove the standard handle by unthreading it from the support mounting ring.
3. The camera is secured to the lighthead by threading it into the same support used by the standard handle.
   a. Align the post with recess. This should align system connector properly. Install camera assembly to lighthead.
   b. Select Camera Menu 1 on the control center.
   c. Verify that all functions of the camera operate correctly using the control center. Verify functions using the optional wireless hand-held control or optional foot control, if applicable.
4. Once camera functions are verified, press the OFF touch pad on the face of the control center.

3.8.2 Removal

1. Rotate lighthead until perpendicular to floor.
2. Unthread camera housing from mounting ring and remove.
3. Install standard handle.

3.9 LIGHTHEAD POSITIONING WITH VIDEO CAMERA

When the lighthead is used with a camera, a disposable sterile cover is placed over the camera housing. (Sterile cover is available from STERIS.)

Figure 3-10. Insta II Camera Disposable Sterile Cover

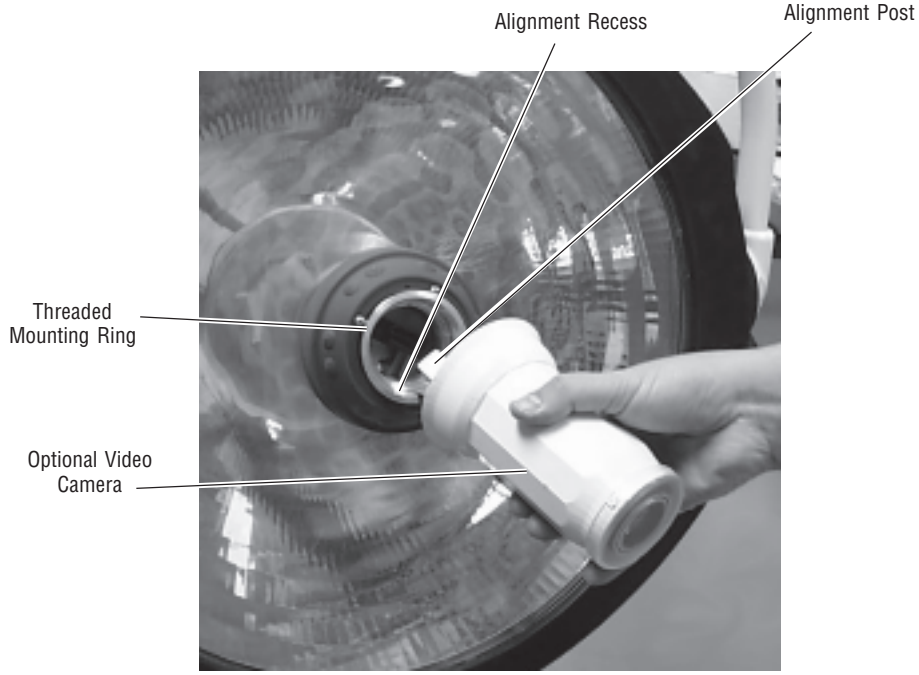


Figure 3-9. Optional Camera Installation

3.10 VIDEO CAMERA OPERATION

The optional video camera is integrated into a removable handle that can be fitted to any Harmony LA 500 or 700 lighthead. Whenever the video option is used, a separated sterile disposable cover must be fitted over the camera before each procedure. This cover allows the camera to be grasped and used in the same way as a standard handle, including positioning the lighthead for optimal illumination, adjusting lighthead intensity and pattern size, as well as positioning the video image field for the best view of the procedure. The sterile cover must be removed from the camera and discarded after each procedure.

Video and control signals are turned on or off at the **control center**; any of the optional remote control units (see below) provide similar control functions. The control center also provides additional control for video brightness and contrast, color gain, still-image capture and time and date display.

Three optional remote devices can control camera functions: a **hand-held wireless control**, **Hermes voice-activated control** (verbal commands and hand-held pendant), or a **foot control**.

The control center functions by transmitting signals via a control cable to the camera located in the lighthead.

The optional wireless control functions by transmitting infrared signals to the control center. To initiate camera functions with either control, press the appropriate touch pad on the control face panel. The hand-held control's IR (infrared) transmitter must be within approximately 15 feet maximum and 50˚ of the control center receiver. The control touch pads are used to control the following camera functions:

Zoom–for determining the level of detail visible in the image field. The Zoom function adjusts the image field continuously between two extremes:

+ (Telephoto). At extreme telephoto, the camera captures an image showing great detail in a small area.

NOTE: At extreme telephoto, any motion of the lighthead/camera will be exaggerated (jerky). The field of focus has little depth at this extreme, forcing the Auto Focus function (if enabled) to refocus the camera when any object (such as a hand) enters the image field, or if camera position is adjusted. The camera is also sensitive to light level changes at extreme telephoto.

– (Wide Angle). At extreme wide angle, the camera captures a large, image with less detail than telephoto.

NOTE: At extreme wide angle, the image field possesses a greater depth of focus and less sensitivity to light level changes.

Rotate–Use this function to change orientation of the video field. Image field can be rotated in either **clockwise** or **counterclockwise** directions.

Bright–Use this function to affect the overall brightness (or darkness) of the video image. The Bright control can be set to adjust itself automatically.

Manual Focus–Use this function to manually set the focus for close-up shots or other special applications. The Auto Focus function must be toggled off to enable manual focusing. Adjust the clarity of focus by pressing the **+** or **–** touch pads.

*NOTE: **+** touch pad moves the lens slightly closer to subject; **–** touch pad moves the lens slightly away from subject.*

Auto Focus – Use this function to toggle Auto Focus on or off. When Auto Focus is ON, the camera automatically focuses on the object in the image field closest to the camera lens. When Auto Focus is turned OFF, the camera maintains focus on the last object upon which it was focused, until Auto Focus is turned back on.

NOTE: It may be necessary to toggle Auto Focus OFF when using the camera at extreme telephoto (close up), to prevent the camera from refocusing on hands and other objects introduced into the image field while videoing procedures.

Red Gain/Blue Gain – These controls are used to adjust image color settings, and are intended to allow the user to compensate for changes in color temperature provided by differing light sources. The gain control can be set to adjust automatically.

3.10.1 HERMES-Ready Control Center

The Hermes Control Center functions by transmitting signals through an interface cable connected to the wall control. When used, the interface cable should be routed to avoid surgical personnel foot traffic. The control center is intended to allow personnel within the sterile field to operate all camera functions using verbal commands or a hand-held pendant. Refer to the Hermes operating manual for more information.

3.10.2 Optional Foot Control

The foot control functions by transmitting signals through a cable connected to the control center. When the foot control is used, the cable should be routed to avoid surgical personnel foot traffic. The foot control is intended to allow personnel within

the sterile field to operate the zoom and rotation functions of the camera.

Foot control is used to control **zoom** and **rotation** functions. Press on appropriate sides of foot pedals to activate foot control functions. Functions controlled through the foot control unit are identical to those controlled through the optional hand-held wireless control or control center.

3.11 GUIDELINES FOR MAXIMIZING VIDEO IMAGE

The following steps will aid in maximizing video imaging effectiveness.

1. Energize the light at medium setting on the control center, and position the lighthead approximately 39" (1000 mm) from the surgical site.
2. Using the hand-held remote, or the control center, zoom in or out (+ or -) until the desired image fills the viewing screen of the monitor.

NOTE: Zooming completely out causes image distortion within the illuminated area.

3. If the light pattern (white circle) does not fill the monitor's screen (shaded square), the image inside the pattern will be distorted.
4. Reposition the camera to orient the focal point (center of the desired image) at the center of the viewing screen.

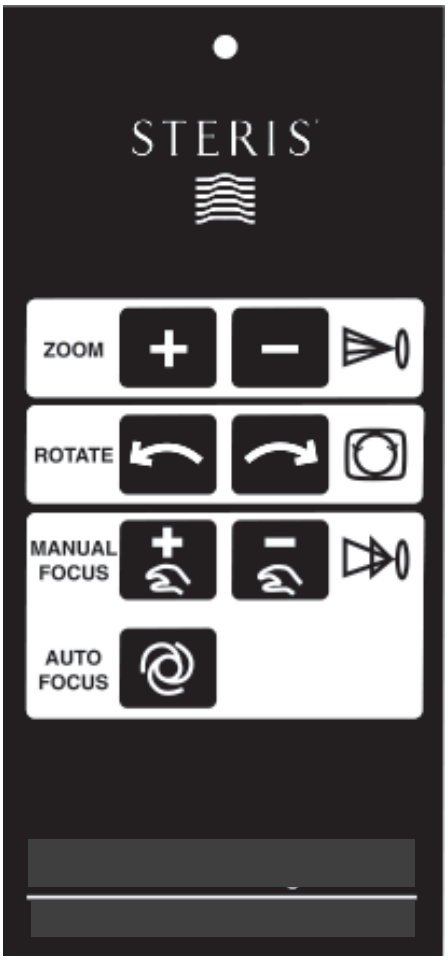
Adjust zoom and rotation as needed:

5. The camera may be zoomed to the full 10x zoom and rotation orientation adjusted as needed.
6. Clockwise and/or counterclockwise orientation is adjusted by using the curved arrow(s) on the hand-held control, the control center or the optional foot control.

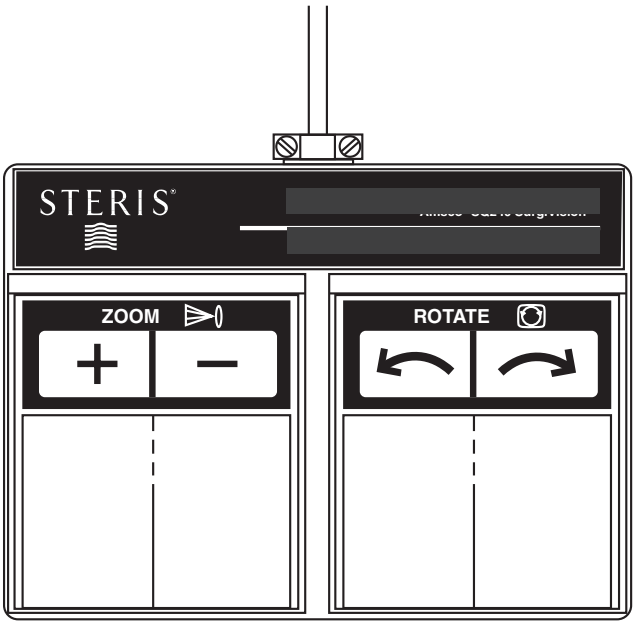
3.11.1 Engage Manual Focus

As instruments are introduced to and removed from the surgical field, the auto focus will attempt to focus on the nearest object, possibly causing the image to blur intermittently. To prevent this effect, once the camera has been positioned and focused onto the surgical site, the manual focus mode may be engaged to maintain image clarity during the procedure.

For deep cavity illumination, it may be necessary to engage the manual focus to focus beyond the nearest object (i.e., the surface area surrounding the incision) so that the desired image can be viewed clearly.



Optional Hand-held Wireless Remote Control



Optional Foot Control

Figure 3-11. Optional Camera Controllers

3.12 DeepSite CONTROL CENTER STATUS INDICATORS

NOTE: See DeepSite Maintenance Manual P764330-210 for more information on the DeepSite Light.

3.12.1 Intensity Level Status

This shows the current intensity level of the DeepSite light.

3.12.2 Lamp Life Status

The DeepSite lighthead uses a high-intensity Xenonlamp module as a light source. The Harmony LA Surgical Lighting and Visualization System can track the approximate life remaining for this lamp module and display it at the Control Center.

NOTE: Refer to Lamp Replacement procedure in Section 6 of this manual when it becomes necessary to replace the lamp.

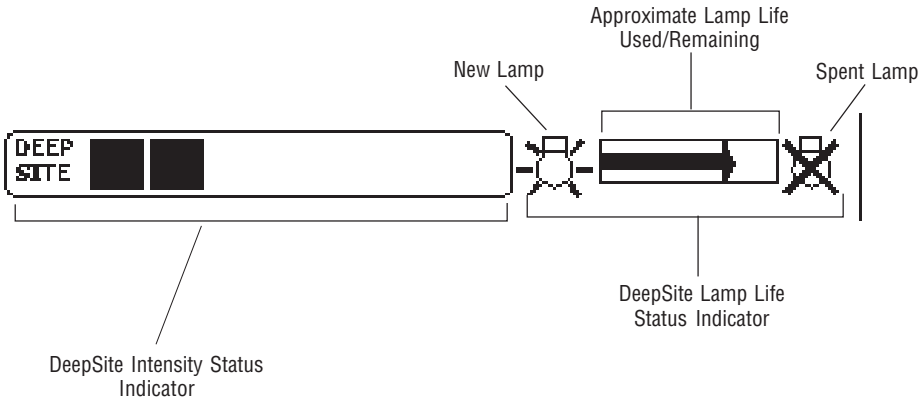


Figure 3-12. DeepSite Control Center Indicators

Section 4: Service Mode

4.1 SERVICE MODE PROCEDURE

4.2 SERVICE MENU 1 SCREEN

Service screens shall be available to service personnel for diagnostics and firmware updates of the wall control and lighthead units. The service screens shall be accessible by performing the following sequence:

1. Turn power ON by pressing systems button.
2. Bring up the System Menu by pressing systems button.
3. Push and **hold** the ON button used to place the Wall Control Unit into the Active Mode.
4. Depress the Select Function Up button.

After performing the sequence described above, the first of a series of Service Menus shall be displayed. Service Menu 1, shown in Figure 4-1, is used to read the firmware part number and revision for the wall control unit and all installed lightheads.

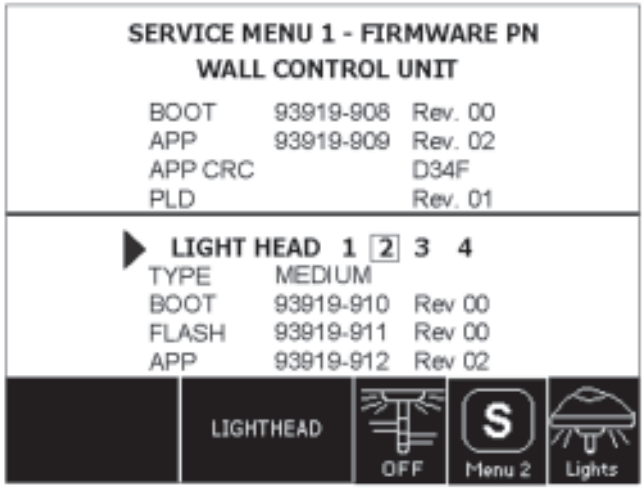


Figure 4-1. Service Menu 1 Screen

1. The context-sensitive switch under the "Lights" description field shall change the LCD display to the Light Control screen.
2. The context-sensitive switch under the "Menu 2" description field shall change the LCD display to the Service Menu 2 screen.
3. The pointer (triangle on left side of lighthead) shall not be affected by the depression of the Up/Down button.
4. The Left/Right buttons under the lighthead field shall select the lighthead whose firmware part numbers are to be displayed. If a lighthead is not installed, the message "Not Installed" shall be displayed in the area where the firmware part numbers are displayed.
5. The lighthead numbers shall correspond to the serial communication port/head numbers at the Hub Interface PWB.
6. The three TYPES of lightheads shall be Small, Medium, or Large.

4.3 SERVICE MENU 2 SCREEN

Service Menu 2, shown in Figure 4-2, shall be used to display the programmed power and operating performance for all of the lighthead units installed.

1. The context-sensitive switch under the "Lights" description field shall change the LCD display to the Light Control screen.
2. The context-sensitive switch under the "Menu 3" description field shall change the LCD display to the Service Menu 3 screen.
3. The context switch Reset Temp shall send a command to all lightheads to clear the stored maximum temperature reading.
4. The Lamp numbers shall correspond to the serial communication port/Head numbers at the Hub Interface PWB.
5. The Left/Right buttons under Lamp shall be used to select the lighthead lamp whose intensity is to be selected with the Up/Down buttons.
6. The Up/Down buttons under Power shall be used to adjust the intensity (from off to a maximum intensity of 7) of the selected lighthead lamp. Depressing and holding the Down button for more that two seconds shall turn the lamp off. If a lamp is off, depressing the Up button shall turn the lamp on at its last intensity setting.
7. The duty cycle listed is in units of percent and is rounded off to the nearest integer (less than 0.5% is rounded down, 0.5% or greater is rounded up).

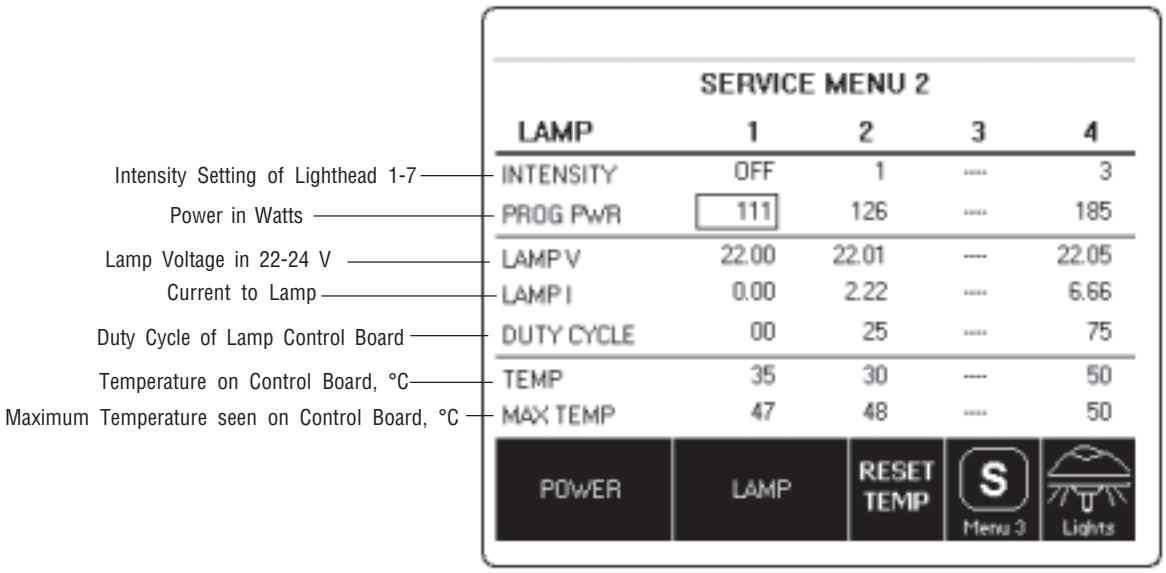

Intensity Setting of Lighthead 1-7
Power in Watts
Lamp Voltage in 22-24 V
Current to Lamp
Duty Cycle of Lamp Control Board
Temperature on Control Board, °C
Maximum Temperature seen on Control Board, °C
SERVICE MENU 2
LAMP 1 2 3 4
INTENSITY OFF 1 ---- 3
PROG PWR 111 126 ---- 185
LAMP V 22.00 22.01 ---- 22.05
LAMP I 0.00 2.22 ---- 6.66
DUTY CYCLE 00 25 ---- 75
TEMP 35 30 ---- 50
MAX TEMP 47 48 ---- 50
POWER
LAMP
RESET TEMP
S
Menu 3
Lights

Figure 4-2. Service Menu 2 Screen

4.4 SERVICE MENU 3 SCREEN

Service Menu 3, shown in Figure 4-3, shall be used to force the Wall Control Unit to undergo a soft reset, place the unit into a mode for reprogramming Flash memory with updated firmware, or reinitialize user settings, such as lamp intensities, in non-volatile RAM.

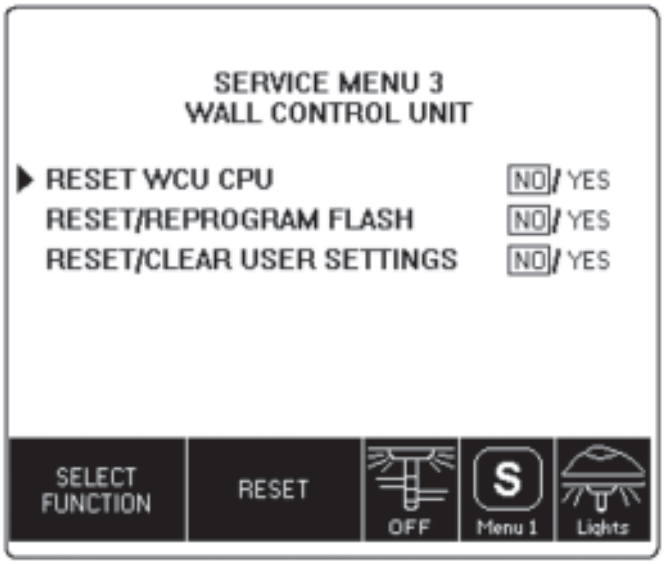


Figure 4-3. Service Menu 3 Screen

1. The context-sensitive switch under the "Lights" description field shall change the LCD display to the Light Control screen described in *SECTION 4.2.*
2. The context-sensitive switch under the "Menu 1" description field shall change the LCD display to the Service Menu 1 screen described in *SECTION 4.2.*
3. Control of the Ambient Light is described in *SECTION 5.2.7.*
4. The Up/Down buttons under the Select Function shall select the type of Wall Control Reset.
5. Depressing the Right buttons under Reset shall cause the Wall Control Unit to reset and perform the selected function.

   RESET WCU CPU – The WCU performs the same startup, testing, and display of messages as if the power was applied to the system.

   RESET/REPROGRAM FLASH – After changing screen choice to "Yes," the WCU will startup and wait for a new application to be downloaded from a PC running STERIS AppLoad. As an alternative, the power can be turned off (at the incoming ac voltage rocker switch in the rough-in box) to the wall control, the AppLoad program started, then upon turning the wall control back on, the software will automatically download.

   RESET/CLEAR USER SETTING – The WCU performs the same startup, testing, and display of messages as if the power was applied to the system. The only difference is that the user settings for the following will be set to default values.

Table 4-1. Control Center Default Values

LANGUAGE:	ENGLISH
AMBIENT LIGHT	NOT INSTALLED
AMBIENT LIGHT MODE	MANUAL
AMBIENT LIGHT	OFF
CAMERA ZOOM SPEED	3
CAMERA FOCUS SPEED	1
LCD CONTRAST	Nominal

Section 5: Theory of Operation

The Harmony™ LA Surgical Lighting and Visualization System is a modular, family of lights consisting of the following major options:

5.1 SUSPENSION SYSTEM

The main system can be purchased as a single lighthead fixture with spacer, as a dual-lighthead system, or as a triple-lighthead system with various arm lengths (reference equipment drawing P129382-382). An auxiliary spindle can be added onto the side of the existing spindle (attaches to ceiling plate). The auxiliary spindle can be used to suport either a second flat panel or CRT monitor. With all these configurations, there exists the possibility of adding the DeepSite fiber optic light as an option to the very bottom of the system main spindle. This allows for a total of four add-ons to the main spindle. With the addition of the secondary spindle, the total number of installed options raises to a maximum of five.

NOTE: Each lighthead is desgined to accept a specially designed video camera module.

Each lighthead has a commutator inside of the suspension package. The entire suspension system (excluding the secondary spindle) is supported at the center by a single vertical tube. The ceiling plate contains a single locking "wedge." (See Figure 5-1.) This wedge is tightened by a single lock nut and washer, which secures the vertical tube at the measured height. A safety ring is installed at the top of the vertical tube to prevent the suspension system from falling down if the wedge is loosened. The suspension system is supplied by Ondal Corporation (Germany). All fasteners and hardware used on the suspension are metric, so metric tool are necessary to service the suspension system. Servicing lightheads or wall controls does not require metric tools.

5.2 MAJOR SYSTEM COMPONENTS

5.2.1 Harmony LA 500 Lighthead

medium lighthead (current sales). The principal components inside the medium lighthead are a pair of wave lenses, a reflector, a control board and a camera interface. Any Harmony LA 500 or 700 lighthead is camera ready. The camera is added to the center light handle after a camera control center modification has been performed.

5.2.2 Harmony LA 300 Lighthead

The LA300 is the smallest lighthead in the Harmony LA series, with an approximate reflector diameter of 300 millimeters. The lighthead is marketed as a high quality exam light, although it can be installed in a OR room environment alongside the LA500 and LA700. The LA300 contains a single lamp, with no redundant lamp feature. A traditional lens and reflector are incorporated in the housing, with no pattern change size provisions. The LA300 is not video camera ready. A complete suspension system exists dedicated to the LA300 exam light.

See service and sales literature for LA300 exam light for specific product details.

5.2.3 Harmony LA 700 Lighthead

The LA700 is the largest lighthead in the Harmony LA series, with an approximate reflector diameter of 700 millimeters. The light features two lamps built on a changeover solenoid module. When the first lamp burns out, an electromechanical solenoid within the lamp change assembly turns on, and rotates the second lamp into position. This system is spring loaded, and does not contain any gear motors. The LA700 is identical in concept to the LA500, only larger in diameter. It contains the same technology, and is camera ready like the LA500. LA700 can be retrofit to the Harmony LA O.R. suspension system. All three Harmony lightheads have a corresponding spring arm size. This means that there is a LA300 spring arm, a LA500 spring Arm, and a LA700 spring arm. If a lighthead is swapped out for a different size, the appropriate size spring arm must be ordered as well.

5.2.4 Flat Panel Monitor Arm

(Monitor and power supply not by STERIS). The flat panel monitor arm is supplied by a 12 VDC power supply mounted to the ceiling plate. Video signal and power are supplied via one large cable which contains eight signal wires and six coaxial shield wires. Connectors supply video signals to input(s) on the medical grade flat panel monitor. A second flat panel monitor or a CRT can be added to the auxiliary spindle of the suspension system

5.2.5 CRT Monitor Arm

(CRT not by STERIS) The CRT is mounted to a shelf that attaches to the suspension system. The monitor power cord plugs into a 110 volt outlet box is located underneath the shelf. The CRT uses the same video signal wire(s) as do the flat panel monitors.

5.2.6 DeepSite Arm

The DeepSite arm is available for all configurations, where ceiling height allows. It is always installed on the very bottom of the mount. The optical commutator is installed directly above the arm inside the mount. The existing illuminator box is installed in the ceiling in close proximity to the center mount.

5.2.7 Ambient Light

(future sales) This additional light, when available, will be installed inside of the canopy. This light requires a separate, dedicated 110 volt supply line to the center mount. It is designed to turn on and provide low-level room illumination when the main surgical lights are turned off.

5.3 CONTROL SYSTEM

The control (reference drawing P093926-043 and P146667-108 or P145667-327) of the Harmony LA Surgical Lighting and Visualization System consists of the basic components:

1. A dedicated dc regulating power supply for each lighthead (typically two supplies total)
2. A power status board for each lighthead.
3. A master control board.
4. A membrane touch pad and display LCD.

The following additional electrical components exist and are located outside of the main wall control module:

1. The **hub interface** board is located on the ceiling plate. This board allows all lighthead wiring to plug into a universal point.
2. A **lighthead control board** is located inside each lighthead. This board is used to create square wave signal at the lamp; and also sends signals back to the control center (main wall control) .
3. A **lighthead intensity selector switch** is located on each lighthead; and is used to adjust lighthead intensity up/down.
4. An **optional fuse block** can be lcoated on the Harmony central mounting plate. This option is used, when monitor arms are present, to route incoming ac power through fuses and terminal strip.

5.4 LAMP POWER EXPLANATION

The power being supplied to the lamp is NOT a straight dc voltage. The voltage is a 22-24 volt square wave signal. The frequency is a constant 20 Khz. The duty cycle is varied to change the intensity of the lamp. There are seven intensity settings in the control system. The control automatically updates the duty cycle to maintain a constant current flow at the lamp. 24V dc is supplied to the lighthead control board at all times, even when the lamp is off. This allows the lighthead to start up when commanded ON from the membrane switch on the lighthead.

5.5 LAMP STARTUP EXPLANATION

The lamp goes through a startup procedure as follows;

1. The control software starts out by applying a small 35% duty cycle voltage to the lamp.
2. The current detection hardware on the control board looks for a steady current (after the initial in rush current has level out) for at least 0.1 seconds. This total time is a lamp warm up time and is typically 1.14 seconds.
3. The duty cycle is increased until it reaches the target lamp intensity last requested by the user.
4. If the lamp current has not stabilized even after two seconds during the warm up period, the controller will shut down the lamp and report a “lamp start error” to the display.

Table 5-1. Lighthead: Large Socket: Primary and Secondary

Intensity	Relative Illuminance (%)	Socket Power (W)
7	100	180
6	90	170
5	80	160
4	70	149
3	60	138
2	50	126
1	40	112

Table 5-2. Lighthead: Medium Socket: Primary

Intensity	Relative Illuminance (%)	Socket Power (W)
7	100	180
6	90	170
5	80	160
4	70	149
3	60	138
2	50	126
1	40	112

Table 5-3. Lighthead: Medium Socket: Secondary

Intensity	Relative Illuminance (%)	Socket Power (W)
7	100	196
6	95	191
5	90	185
4	85	180
3	80	174
2	75	168
1	70	162

Table 5-4. Lighthead: Small Socket: Primary

Intensity	Relative Illuminance (%)	Socket Power (W)
7	100	100
6	90	94
5	80	88
4	70	82
3	60	76
2	50	70
1	40	63

Note: *The same lamp is used for the primary and backup sockets for the large and medium lightheads*

5.6 LIGHTHEAD BTU OUTPUT

The harmony LA lightheads emit the following amount of heat energy during normal use:

LA300 340 BTU/Hour

LA500 673 BTU/Hour

LA700 619 BTU/Hour

5.7 SERIAL NUMBER EXPLANATION

Two serial number formats exist for the Harmony LA light system; a STERIS Montgomery format and an Ondal serial number format. The following list explains the formats. When ordering service parts or requesting technical support, have the applicable serial number available for the item being worked on (spring arm, ceiling plate, control, etc.).

Lighthead – STERIS Montgomery format beginning with 04.

Wall Control System – STERIS Montgomery format beginning with 04. Example:

Plant	Day of Year	Year	Unit that Day
04	326	02	049

NOTE: Wall controls manufactured beginning in year 2005 will have a D (Domestic) or G (Global) following the serial number. This letter is critical for differentiation between domestic wall controls and global wall controls. See SECTION 9 for a complete wall control serial number listing.

1101 – Ceiling plate
1102 – Central axis or spindle
1103 – Spring arm for large & medium lighthead
1104 – Spring arm for monitors
1105 – Auxiliary spindle
1106 – Spring arm w/extension arm for small lighthead
1107 – ceiling mount small lighthead
1108 – wall mount small lighthead
1109 – mobile stand samll lighthead

Product Catagory	Month	Year	5-Digit Counting Number
1102	11	4	03392

5.8 HARMONY LA WORLDWIDE RELEASE CONTROL SYSTEM THEORY OF OPERATION

A new series of part numbers is being released for Harmony LA Surgical Light Control Systems. These part numbers are necessary, since they represent a new series of controls that meet Class B electrical emission standards, which are required in many countries in order to sell there. These new controls are being sold globally as of October 2004. It is the intent of STERIS Corporation to replace the existing Harmony Product line of controls in January 2005, and use these new Global controls for both Domestic USA sales and Global sales in January 2005.

The new style controls will be marked with a G (Global) following the serial number. Domestic controls will be labeled with a D (Domestic) after January 2005. **When requesting parts or technical support, please have the complete serial number of the control system at hand.** (See *SECTION 9* for a complete wall control serial number listing.)

1. **Standard Wall Control**. The new bill of material for this control is B129382-584, the part number for the wall control only is 146667-327. There are no outside changes to the exterior of the wall control (other than larger power status boards, and serial number description above) that would alert the technician to the presence of this new control system. This new wall control is similar to the existing wall control, except for the following major changes;

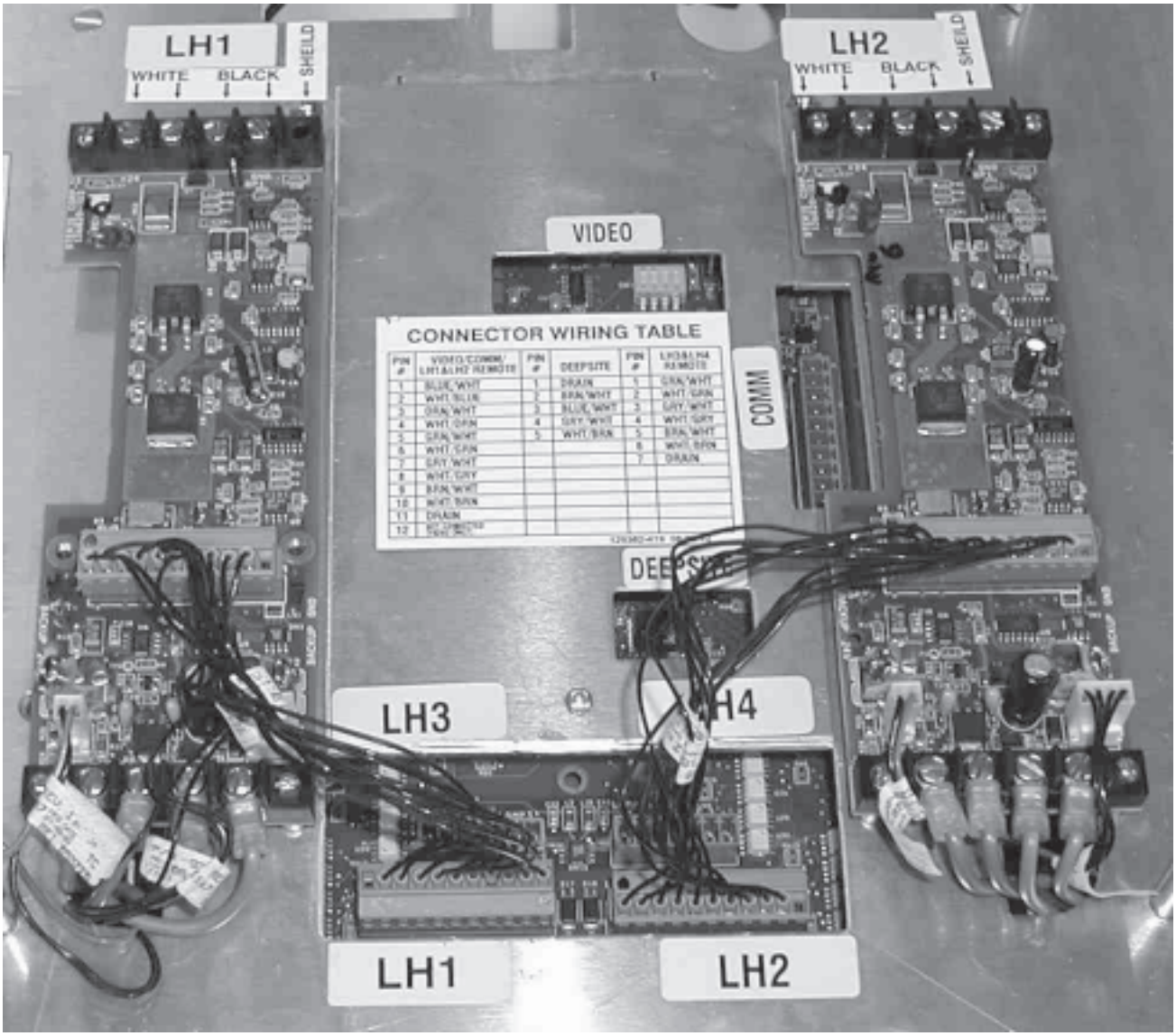


Figure 5-1. View of Global Control Power Status Boards

- **New power status circuit boards**. The new part number for these circuit boards is P136820-103. These new circuit boards incorporate a new function within them. This new circuit board allows a separate 24 Volt dc supply (from the hospital) to be connected to the boards. This is called the "auto changeover system". It allows the lighting system to function even if main hospital 110 volt power goes down. This is typically a requirement in European hospitals, and is not a domestic USA requirement. Electrical connections to these boards are identified in the installation instructions that ship with the product. The *INSTALLATION INSTRUCTIONS* that reference this new control is part number P129382-396, dated 6/18/04 or later. In addition, there are installation instruction for the wall control only, that ship with the product, part number P129387-048. Installation of this new control is similar, but not identical to the older design. Please review these documents thoroughly before installing this product. See Figure 5-1.
- **New Power Supplies.** There are new power supply assemblies within the standard wall control. Their new part number is 146667-330. This part number includes the power supply, fan and metal enclosure. They are designed to meet more stringent class B electrical emission standards.
- **New Electrical System Schematic.** There are numerous smaller changes to the electri-

cal schematic that are not visible to the service technician. Therefore, a separate, new electrical schematic was created for the global wall control. The global wall control schematic is part number 146667-332. As of the date of this service manual, the latest revision of this schematic is Rev. 3, dated November 2004. *Domestic Wall control units manufactured prior to October 2004 should use the old schematic, part number 146667-108*

- **Cable Communication.** The part number has changed from P93926-021 to P93926-409. This is due to the fact that pin 11 (drain), is connected on the control board end and open on the hub interface end of the new harness. The new harness *can* be used in place of the old cable on previously installed units.
- **Video Cable.** The part number has changed from P93926-318 to P93926-411. This is due to the fact that pin 11 (drain), is connected on the control board end and open on the hub interface end of the new harness. The new harness *can* be used in place of the old cable on previously installed units.
- **Line Filter Connection.** In the event that a standard domestic wall control is replaced in the field with a new global control, the line filter assembly will need to be replaced. See rough in box information at the end of this section.

2. **Remote Power Supply Modules (RPM).** There are new RPM unit part numbers created in support of the Global control design. The new bill of materials will be B129382-586 (dual) and B129382-585 (single). Individual replacement part numbers are P146667-329 (dual) and P146667-328 (single). The design of the new RPM modules is similar to the old, except for these major changes;
   - **New power status circuit boards.** Identical to comments for new circuit boards listed under standard wall control.
   - **New Power Supplies.** Identical to comments for new power supplies listed under standard wall control.
   - **Remote Power Status Communication Cable.** The part number has changed from P93926-330 to P93926-413. The pin outs of this cable are different than before. Follow these guidelines;
     1. Standard wall control; J4/J6 hookup, pin 7 is unused.
     2. Low-profile control; J3/J5 hookup, pin 11, drain, is only connected at the RPM end, not the low profile end.
     3. In general, if there any unused wires in a communication harness they should be all tied to drain at the RPM side of the harness. This will reduce electrical noise on all the signal wires.
   - **Installation Instructions and Hookups**. The new installation instructions for the RPM modules is part number P093926-392. Please review this document thoroughly before installing this product.
   - **Backwards Compatibility and Connections It is very important to note that the connections between the RPM and either the standard wall control or the low profile control are different than before.** The main difference relates to the way the remote power status cable (part number 93926-413) is connected between the RPM and either the standard wall control or the low profile control at connectors J4 and J6. The different pinouts for these connection points are identified on schematic P146667-332, page 2, **Wall Control Connector Wiring Table**. The difference in connection method is also listed in a label, on the back of the standard wall control, the Low profile control, and the remote power modules.

     For this reason, the new RPMs ***are not*** backwards compatible with the older RPMs. In order to use this new RPM in place of the old, the connections must be changed per the wiring table referenced above and the specific installation instructions for the product. Failure to do this will cause the RPM to function incorrectly.

3. **Low Profile Control** – A new part number exists for the global version of the low profile control. The new bill of material for this control is B129382-682, the part number for the low profile control only is P146667-322. The design is very similar to the existing low profile wall control. The only major difference being the communication, and video inter connect cabling and wiring labels previously addressed in this section.
4. **Rough-In Box assembly** – A new part number and design exists for the rough in box assembly. The new part number is P146667-323. The design of the rough in box incorporates the following changes:

- The outside dimensions of the box are similar to the old box, however, the metal portion of the box is now a three piece design. The sections are the back box, the ac line filter and the front flange.
- The front flange is adjustable in relation to the back box. This allows the front surface of the box to be adjusted so that it is flush with the finished wall.
- There is a new line filter assembly, part number P136820-234. This newer design is intended to reduce electrical emissions. It is not compatible with prior line filters in the rough in box assembly. The line filter has a slightly different mechanical mounting configuration. There is also a new ac electrical connector, rather than the spade terminals used in the past. The mounting of the line filter within the rough in box is slightly different than the old, and will require drilling one additional hole in the rough in box to accommodate a self tapping sheet metal screw.

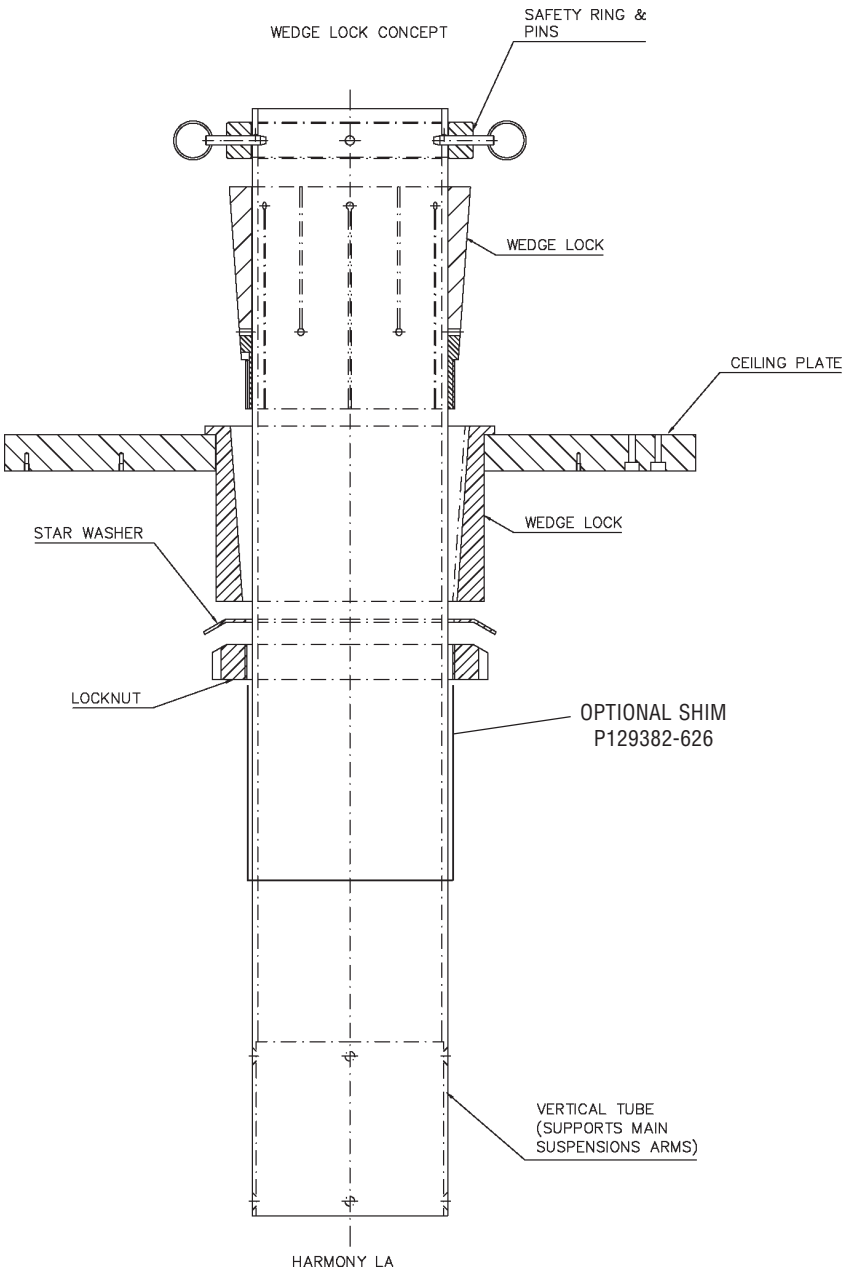


Figure 5-2. Wedge Lock and Vertical Tube

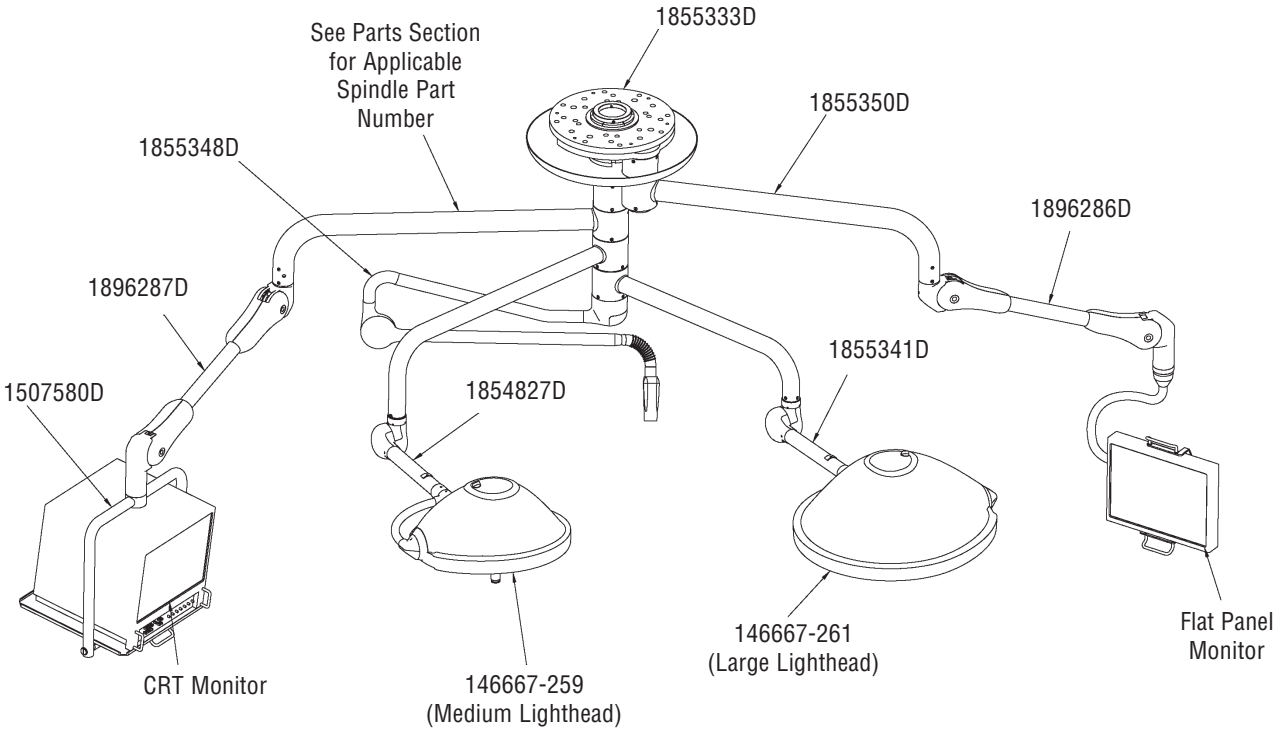


Figure 5-3. Typical Harmony LA System

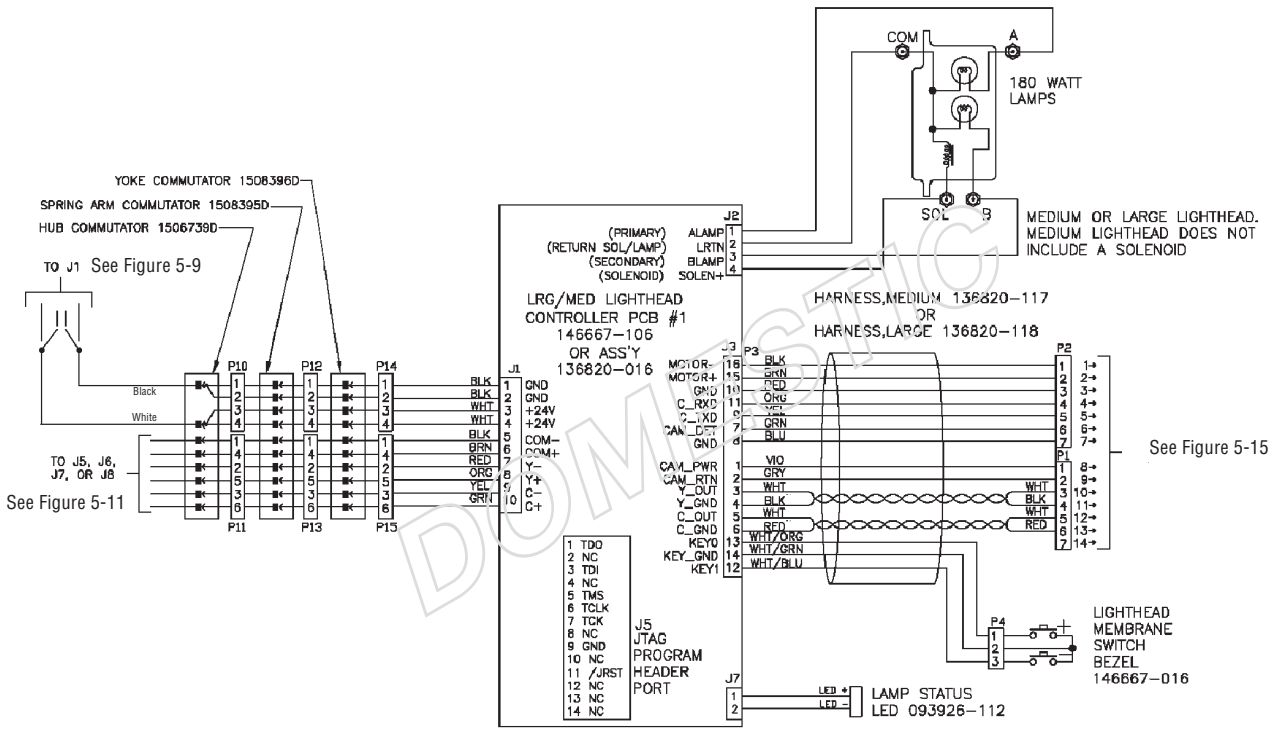


Figure 5-4. Domestic Medium/Large Lighthead Board Controller

DOMESTIC

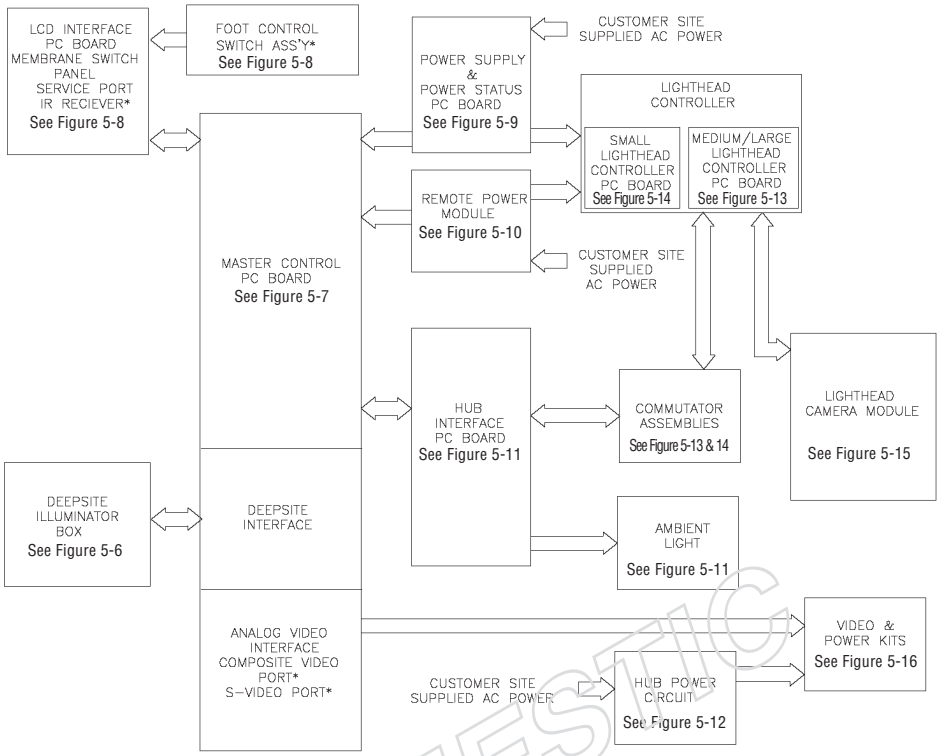


Figure 5-5. Domestic Harmony System Block Diagram

DOMESTIC

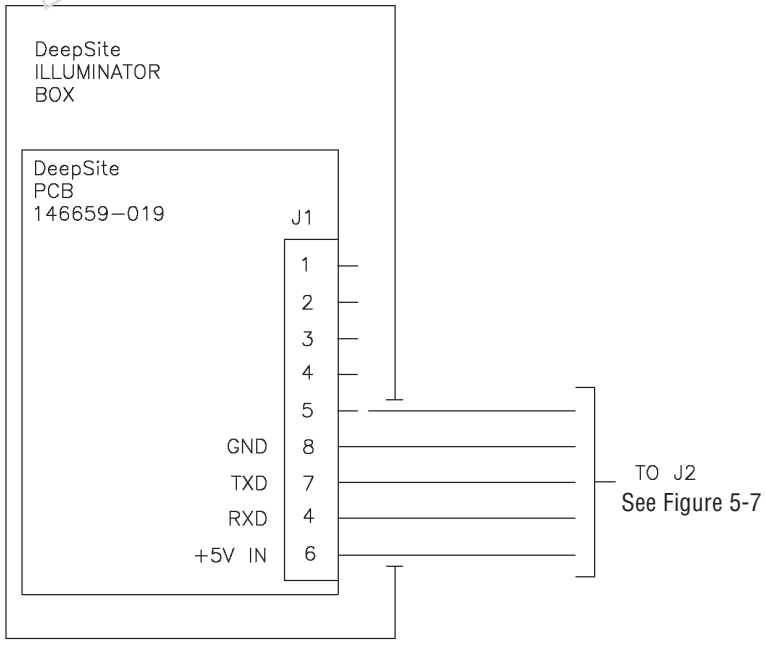


Figure 5-6. Domestic Deepsite Illuminator Box

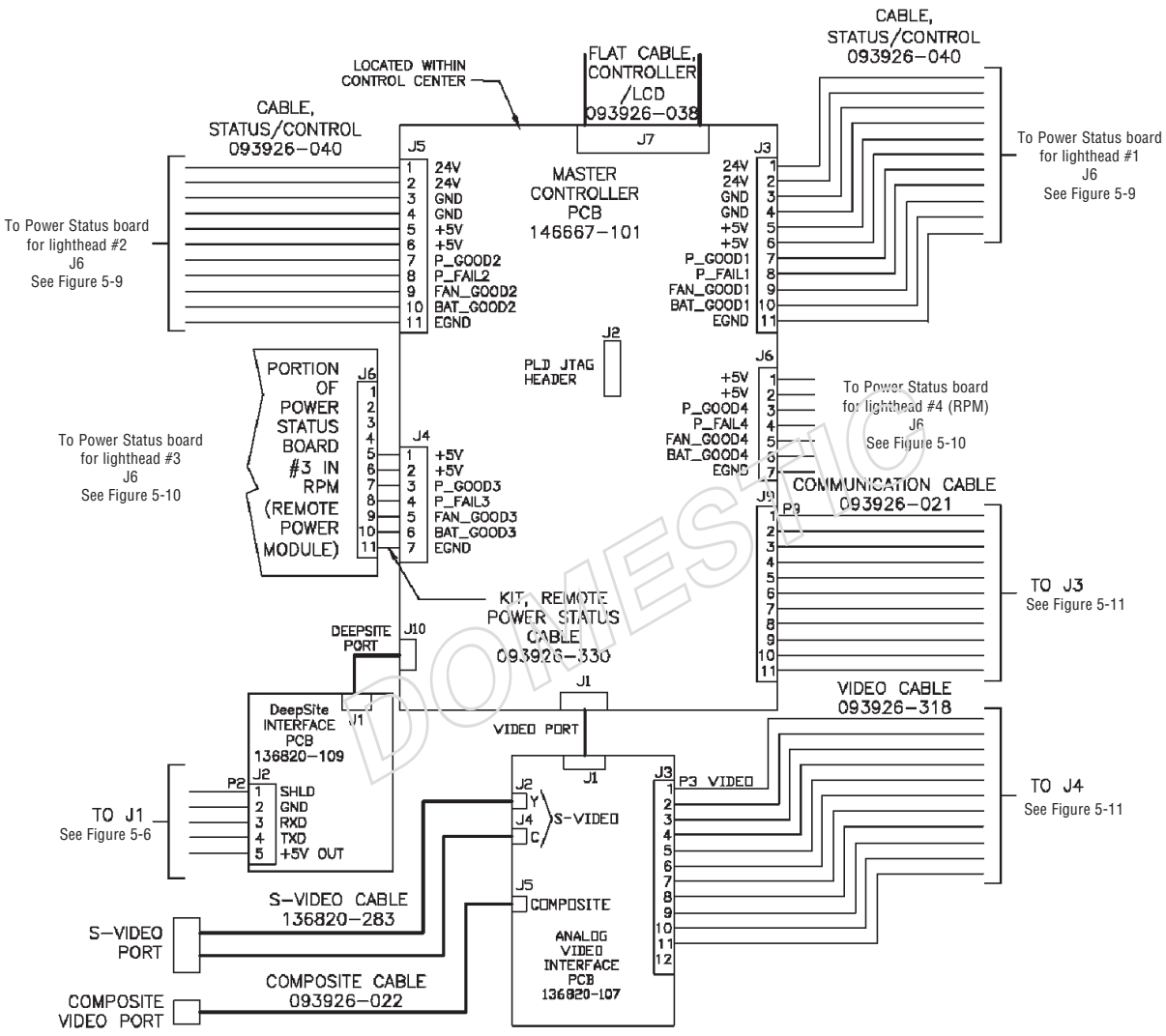


Figure 5-7. Domestic Master Control Board w/DeepSite Interface Board & Analog Video Interface Board

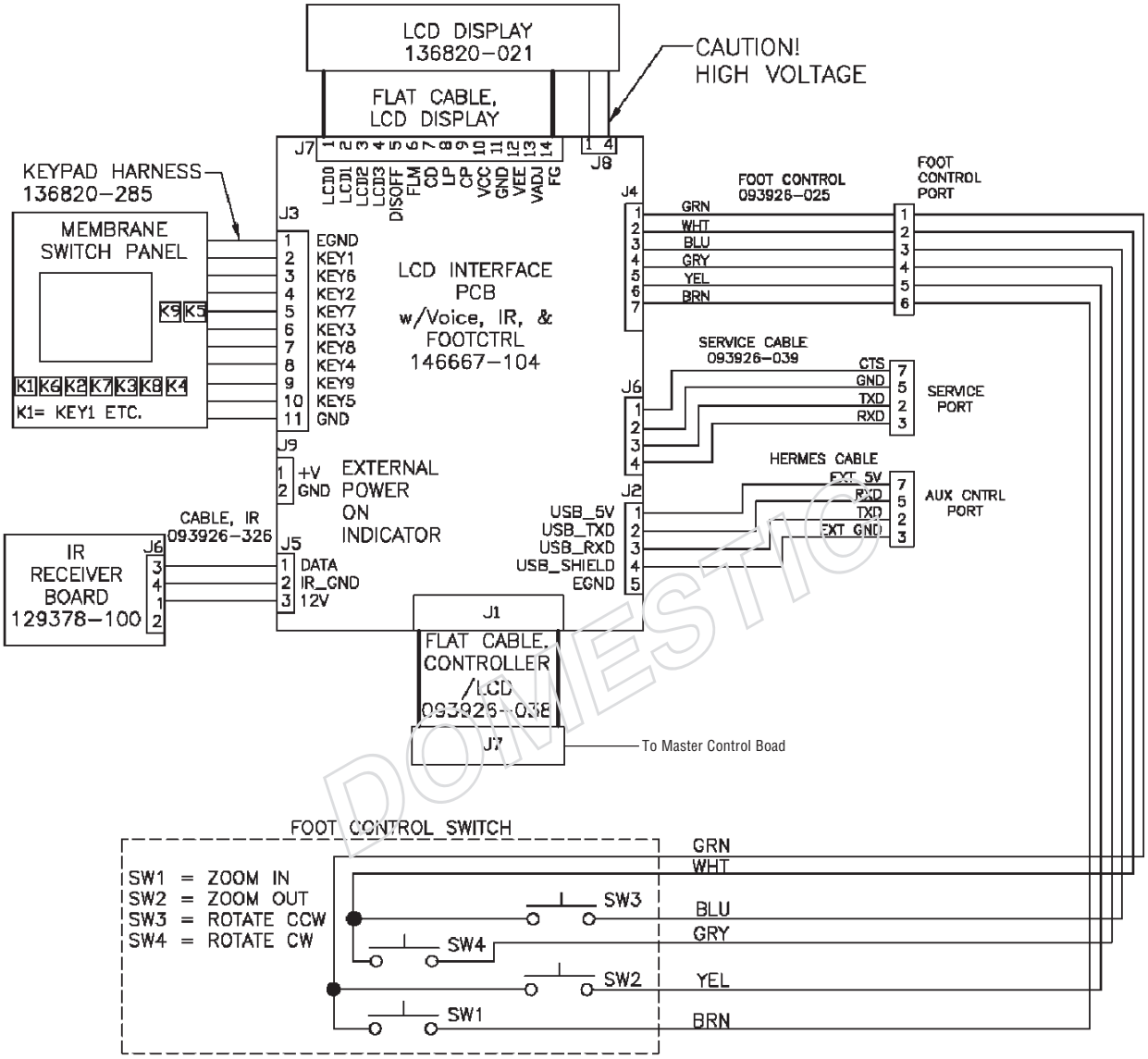


Figure 5-8. Domestic LCD Interface Board w/Membrane Switch Panel, Service Port AUX Port, IR Receiver, & Foot Control Assembly

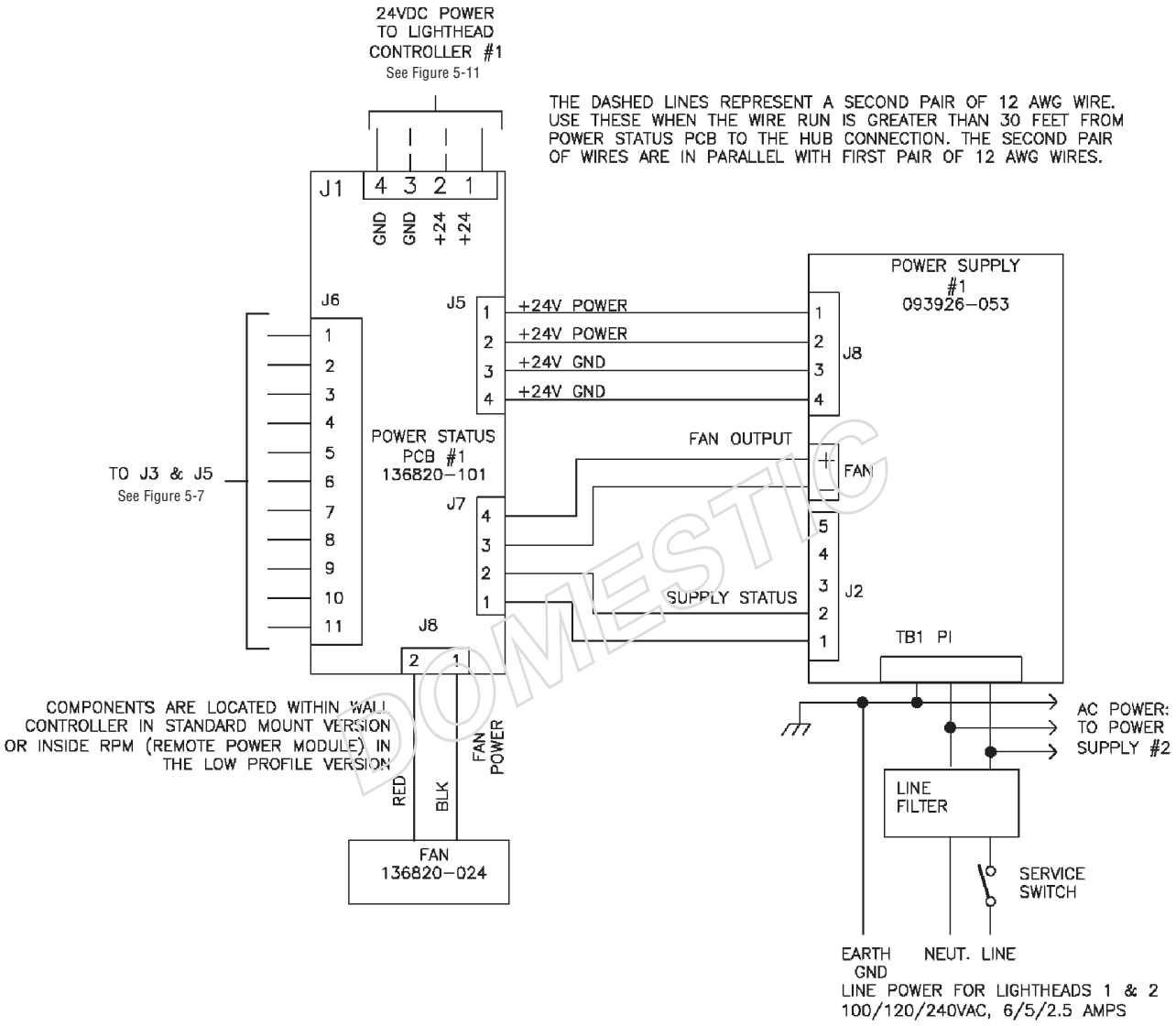


Figure 5-9. Domestic Power Supply & Power Status Module

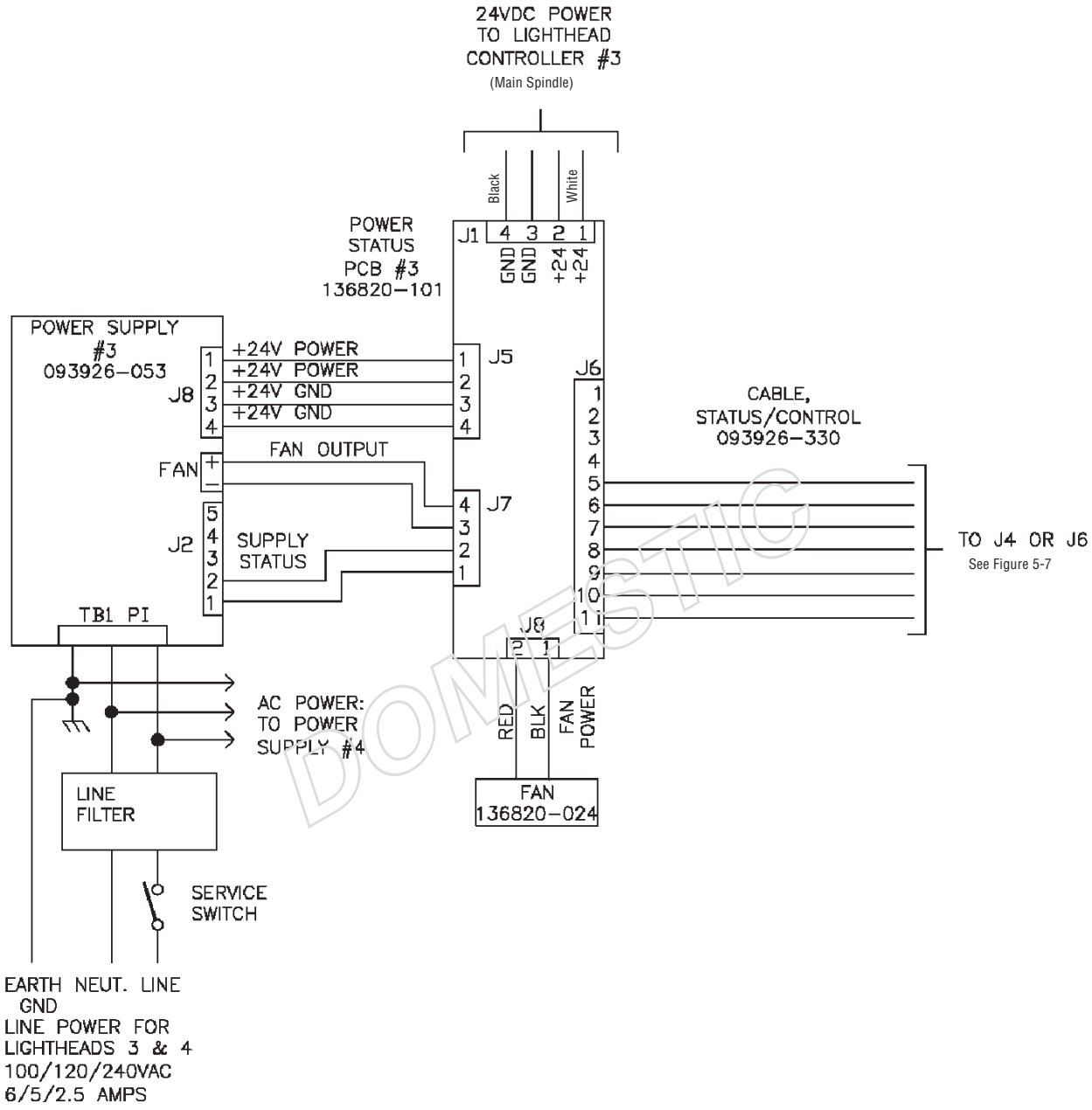


Figure 5-10. Domestic Remote Power Module

DOMESTIC

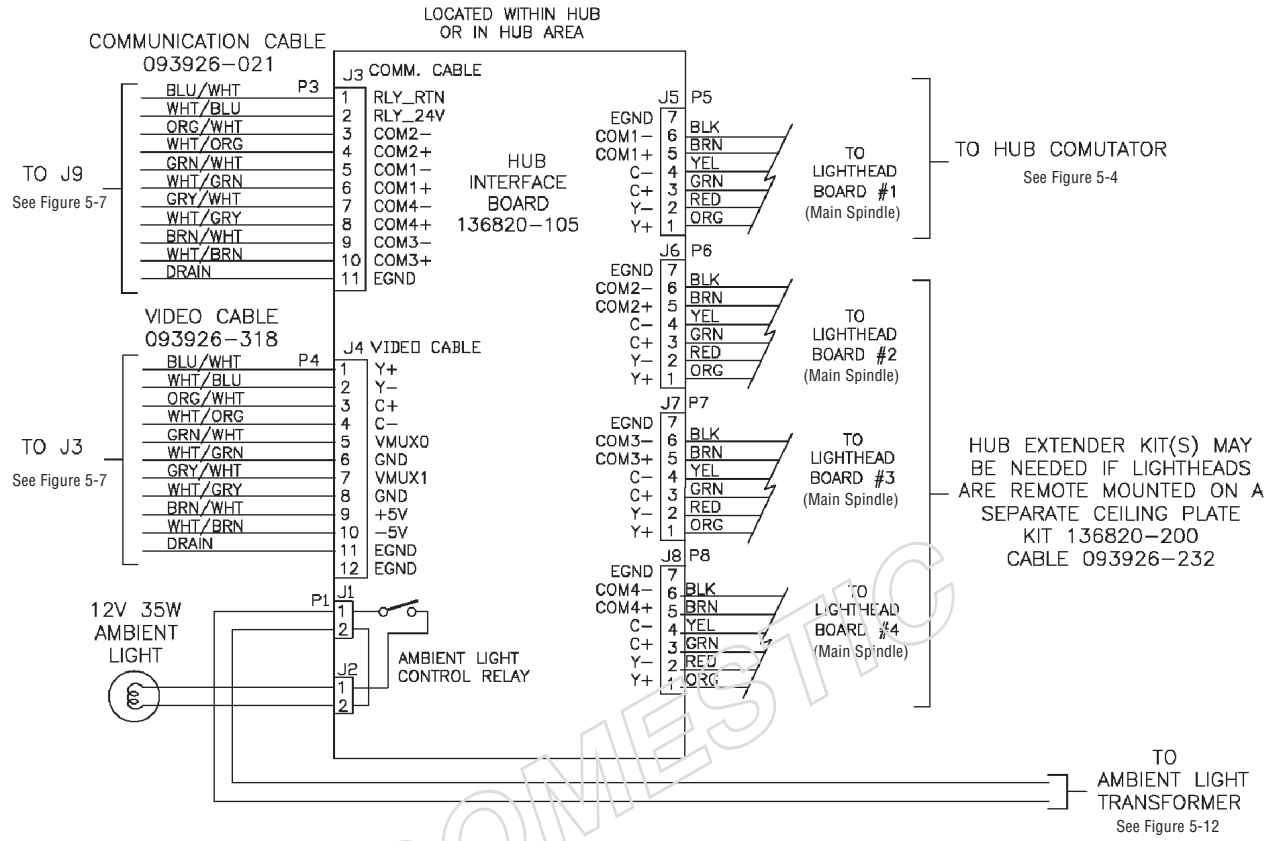


Figure 5-11. Domestic Hub Interface Board

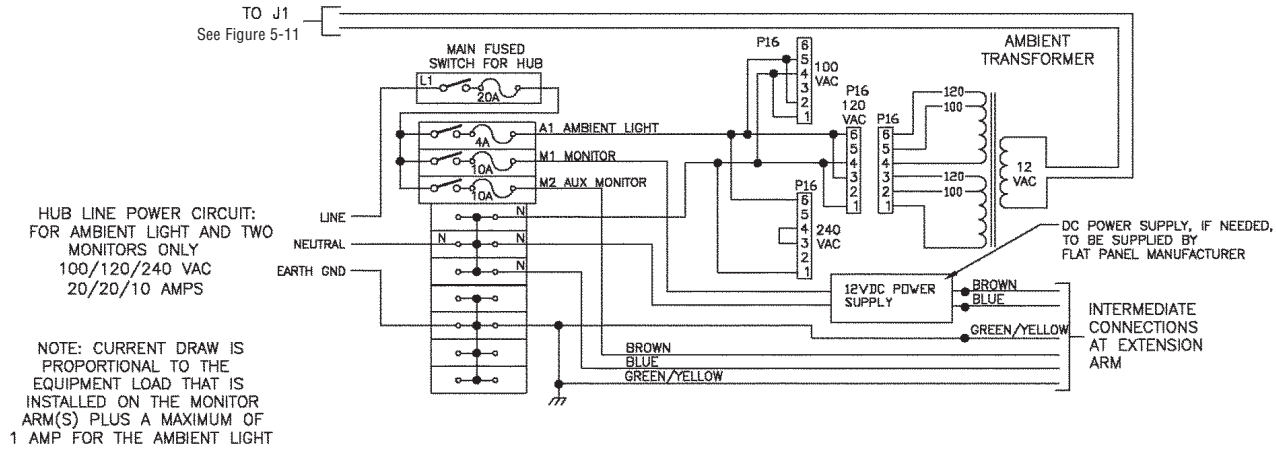


Figure 5-12. Domestic Hub Power Circuit

DOMESTIC

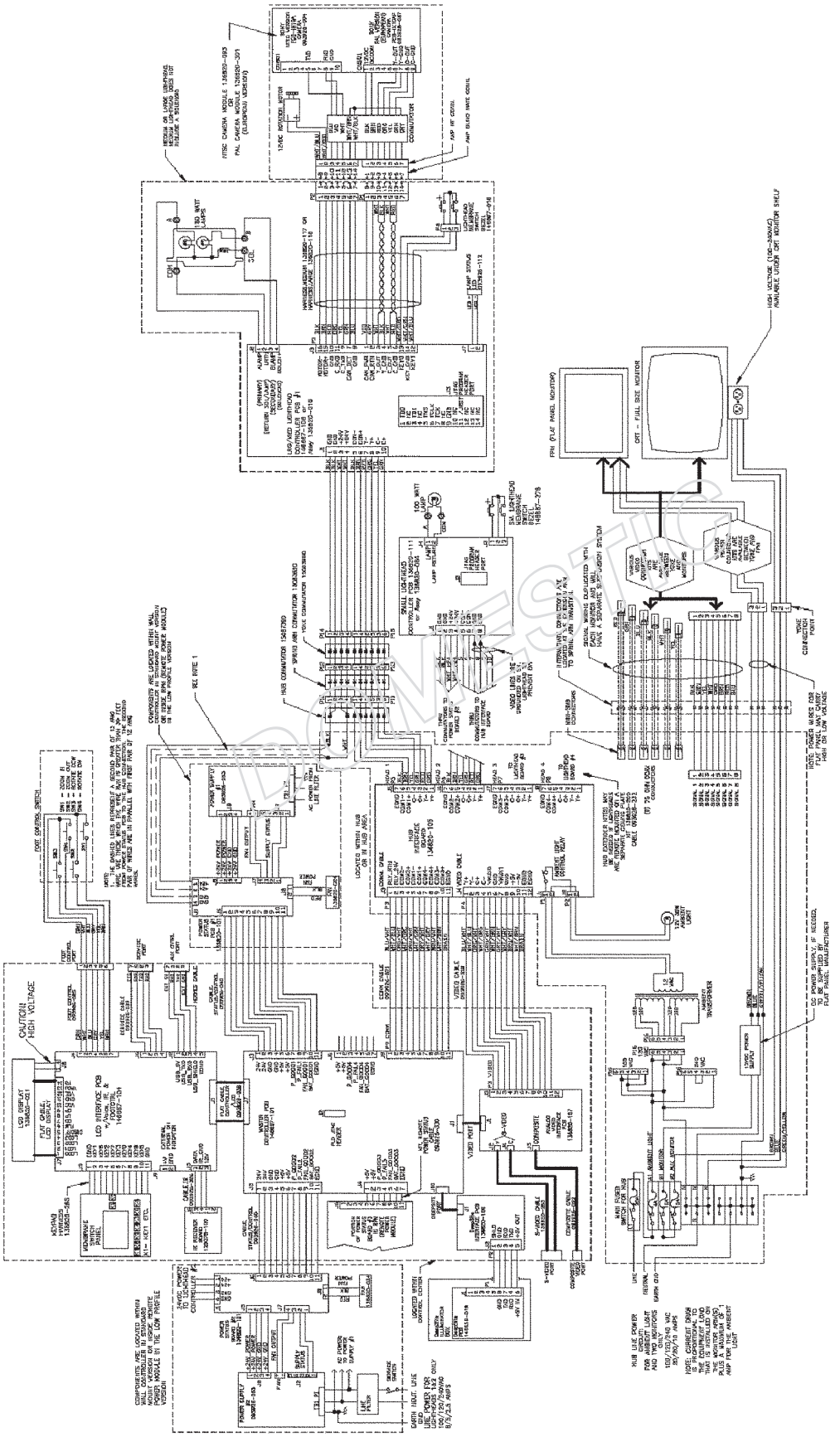


Figure 5-13. Domestic Schematic

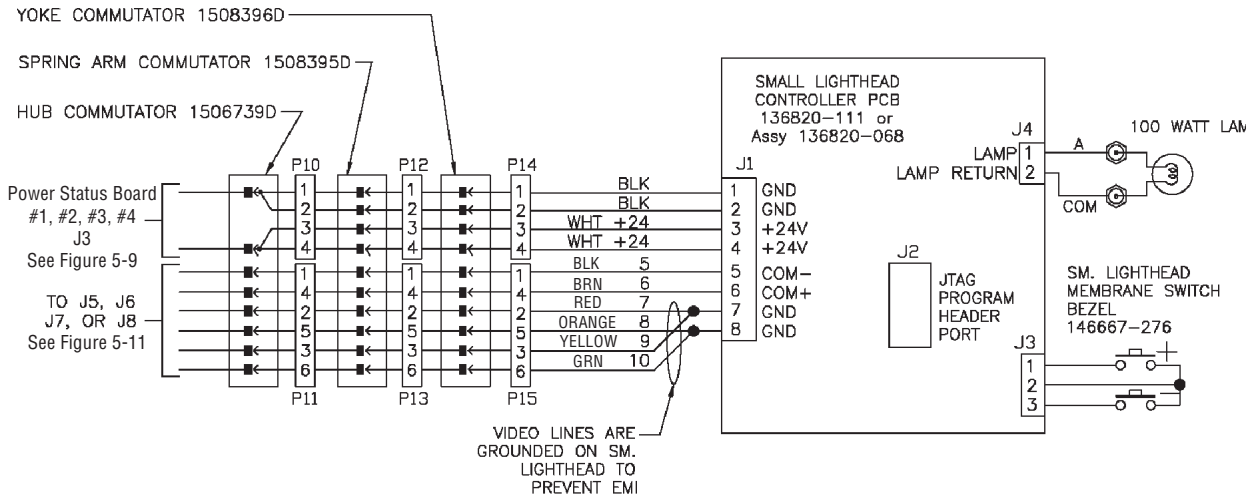


Figure 5-14. Domestic Small Lighthead Controller Board

DOMESTIC

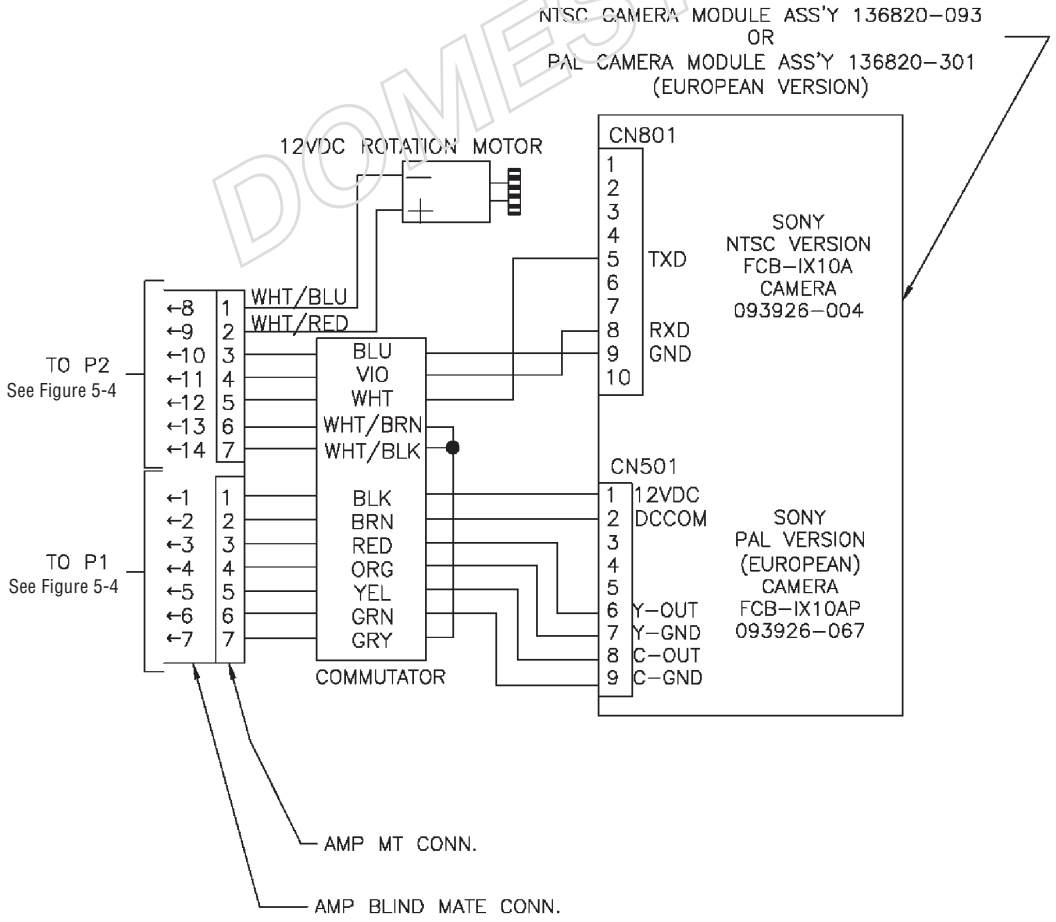


Figure 5-15. Domestic Lighthead Camera Module

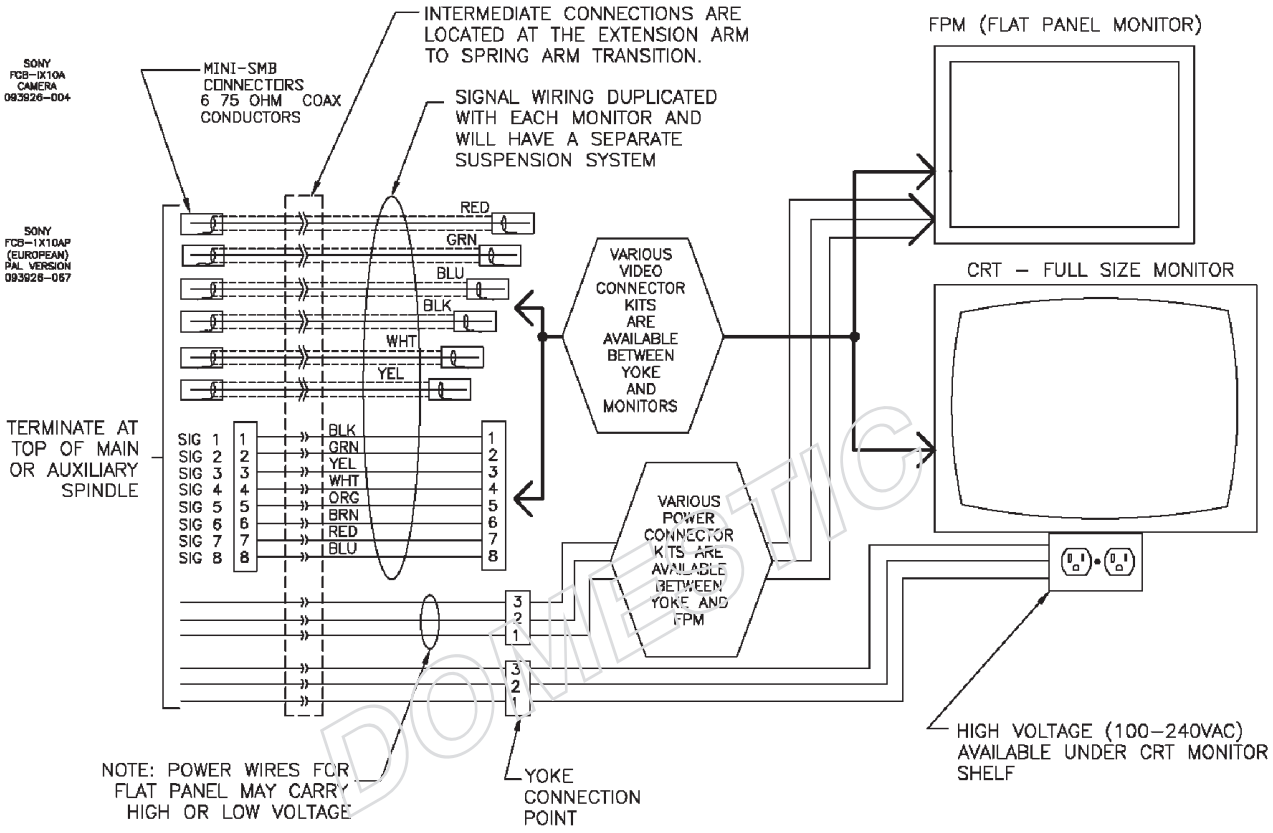


Figure 5-16. Domestic Video & Power Kits

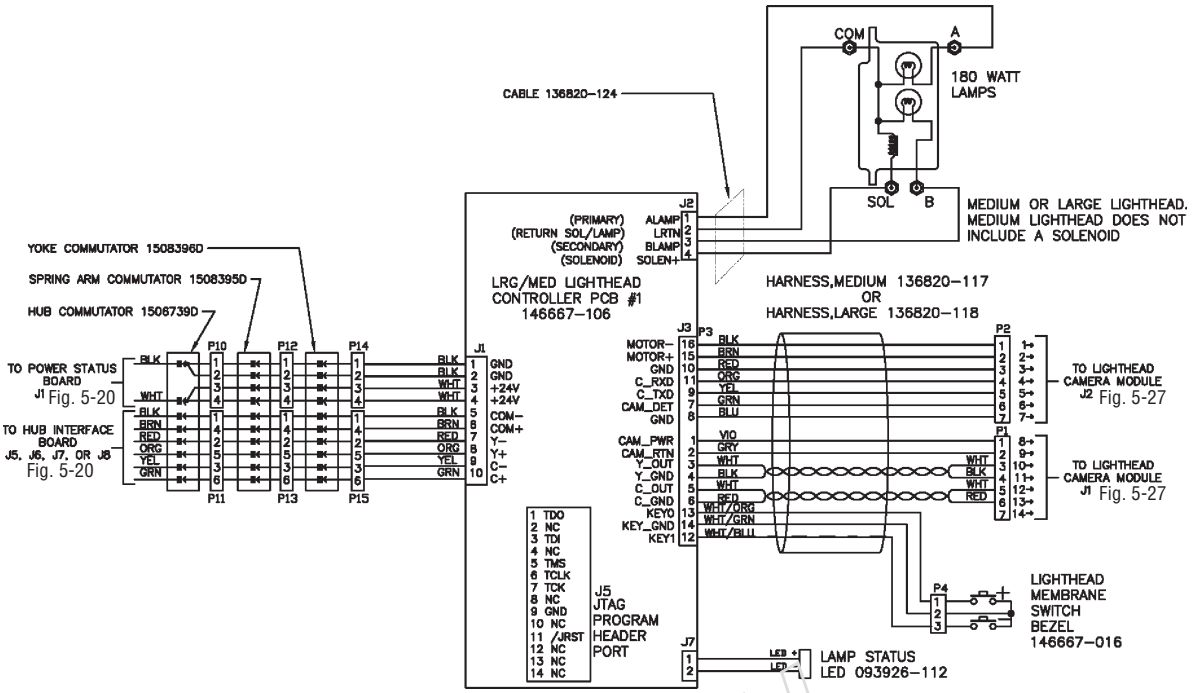


Figure 5-17. Global Medium/Large Lighthead Board Controller

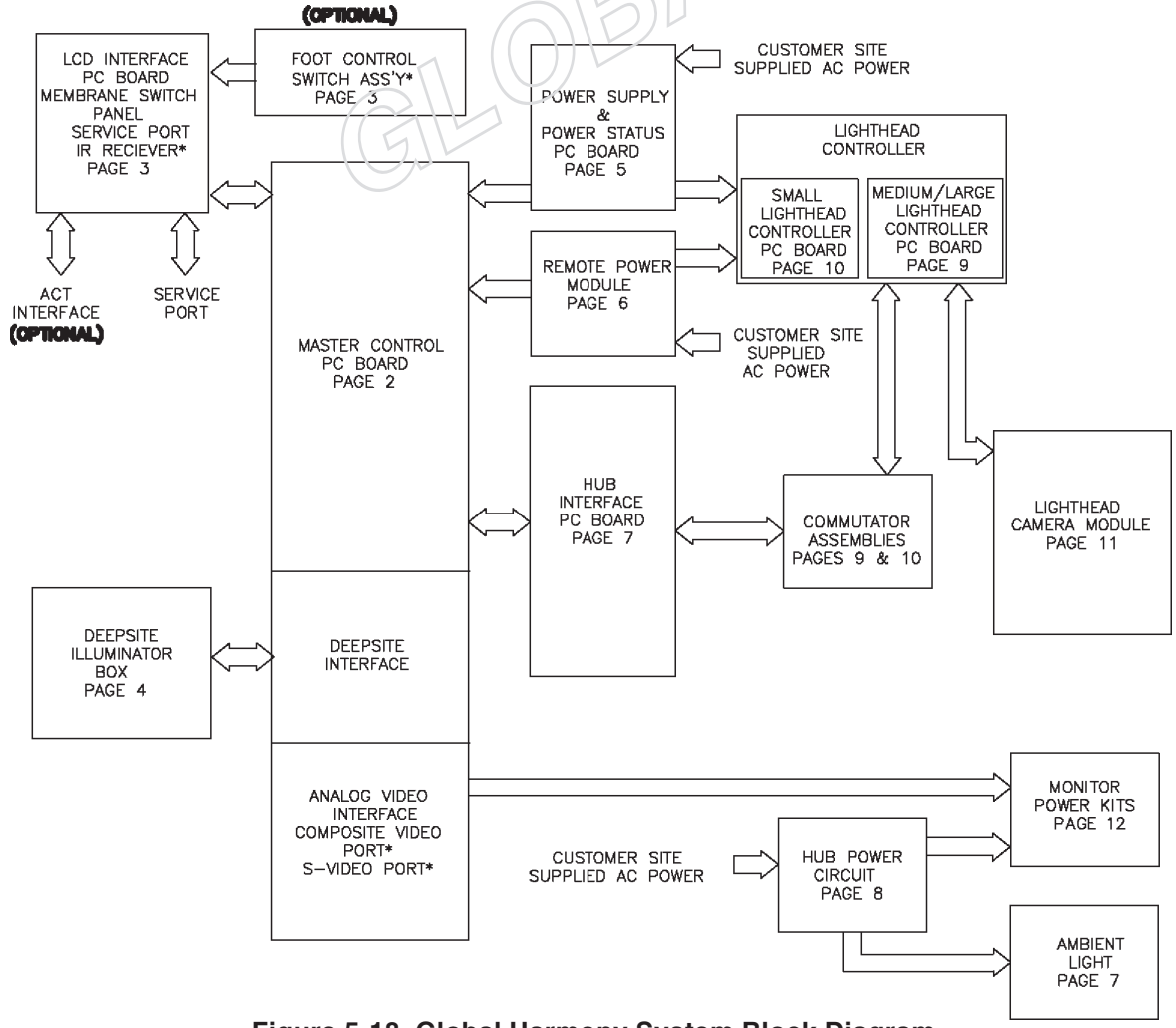

(OPTIONAL)
LCD INTERFACE PC BOARD MEMBRANE SWITCH PANEL SERVICE PORT IR RECIEVER* PAGE 3
FOOT CONTROL SWITCH ASS'Y* PAGE 3
POWER SUPPLY & POWER STATUS PC BOARD PAGE 5
CUSTOMER SITE SUPPLIED AC POWER
LIGHTHEAD CONTROLLER
SMALL LIGHTHEAD CONTROLLER PC BOARD PAGE 10
MEDIUM/LARGE LIGHTHEAD CONTROLLER PC BOARD PAGE 9
ACT INTERFACE (OPTIONAL)
SERVICE PORT
MASTER CONTROL PC BOARD PAGE 2
REMOTE POWER MODULE PAGE 6
CUSTOMER SITE SUPPLIED AC POWER
HUB INTERFACE PC BOARD PAGE 7
COMMUTATOR ASSEMBLIES PAGES 9 & 10
LIGHTHEAD CAMERA MODULE PAGE 11
DEEPSITE ILLUMINATOR BOX PAGE 4
DEEPSITE INTERFACE
ANALOG VIDEO INTERFACE COMPOSITE VIDEO PORT* S-VIDEO PORT*
MONITOR POWER KITS PAGE 12
CUSTOMER SITE SUPPLIED AC POWER
HUB POWER CIRCUIT PAGE 8
AMBIENT LIGHT PAGE 7

Figure 5-18. Global Harmony System Block Diagram

GLOBAL

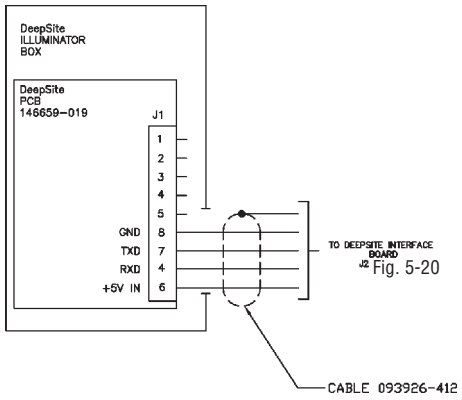


Figure 5-19. Global Deepsite Illuminator Box

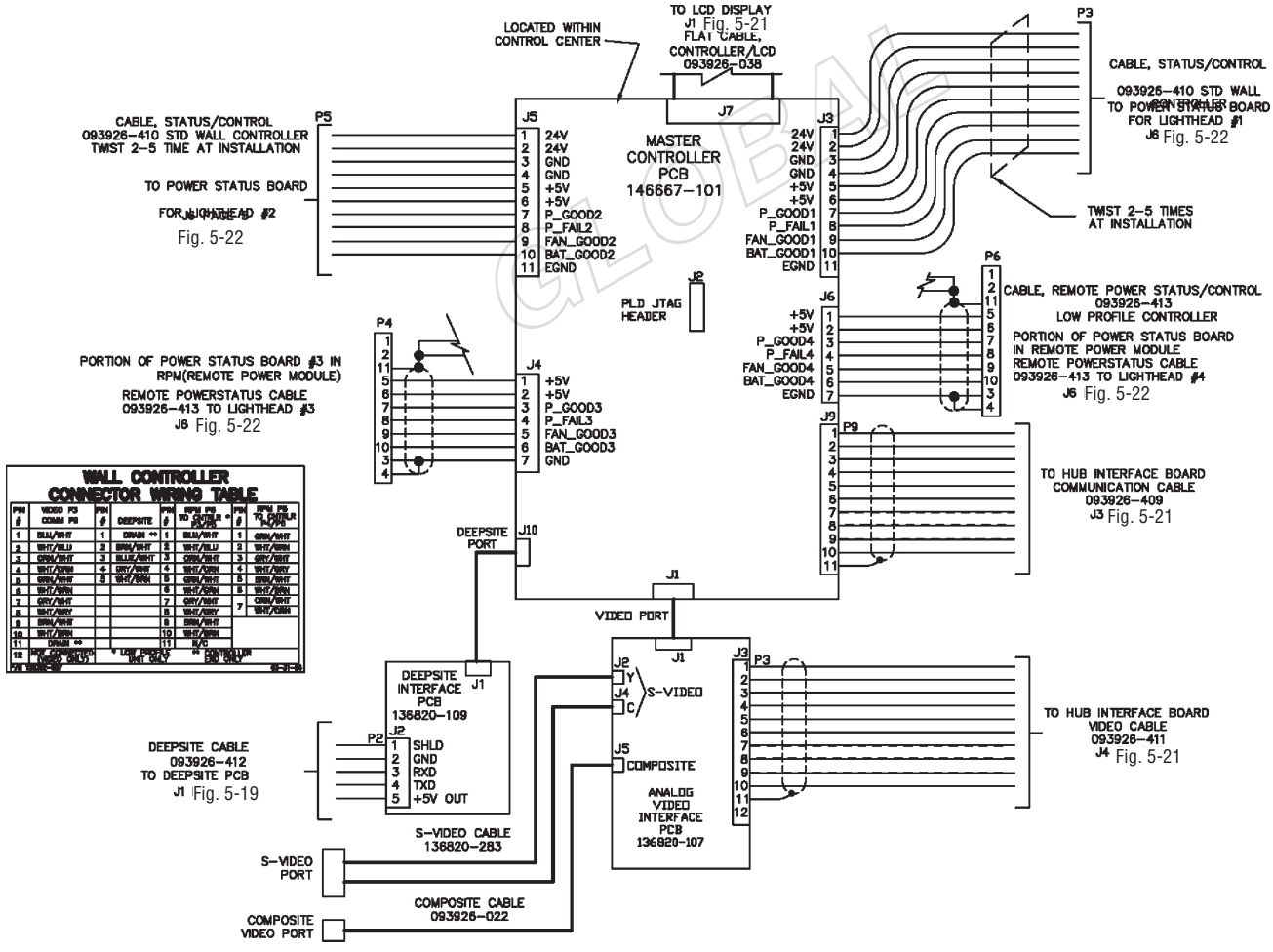


Figure 5-20. Global Master Control Board w/DeepSite Interface Board & Analog Video Interface Board

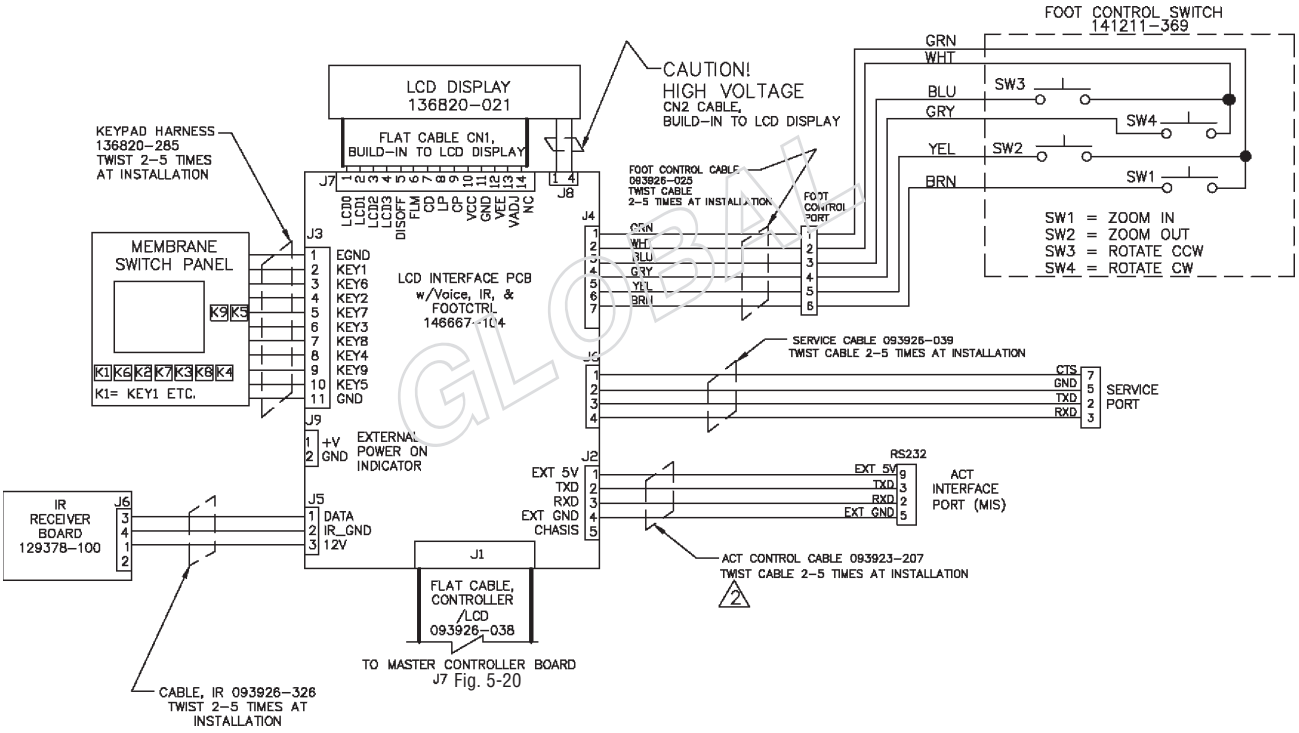


Figure 5-21. Global LCD Interface Board w/Membrane Switch Panel, Service Port AUX Port, IR Receiver, and Foot Control Assembly

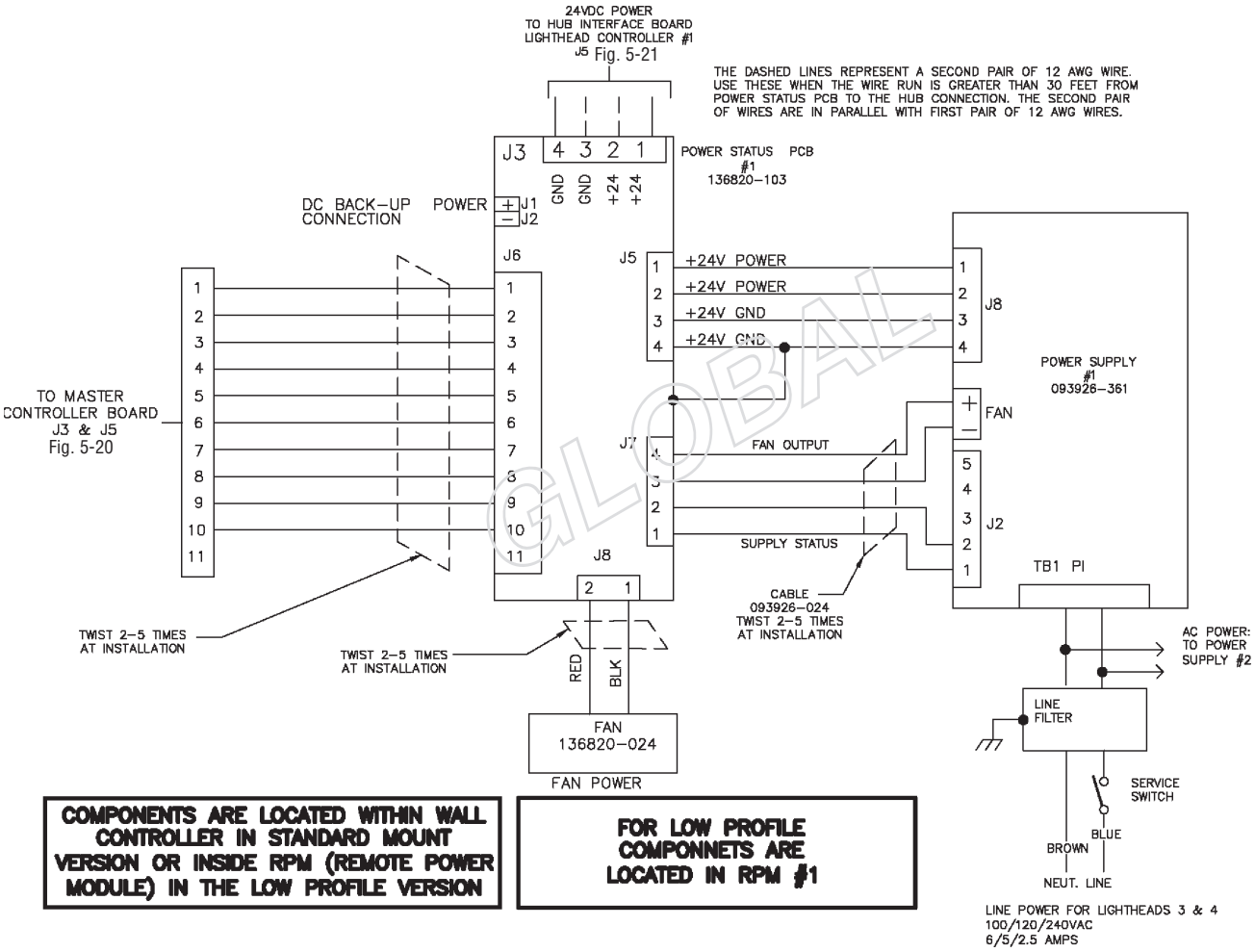


Figure 5-22. Global Power Supply & Power Status Module

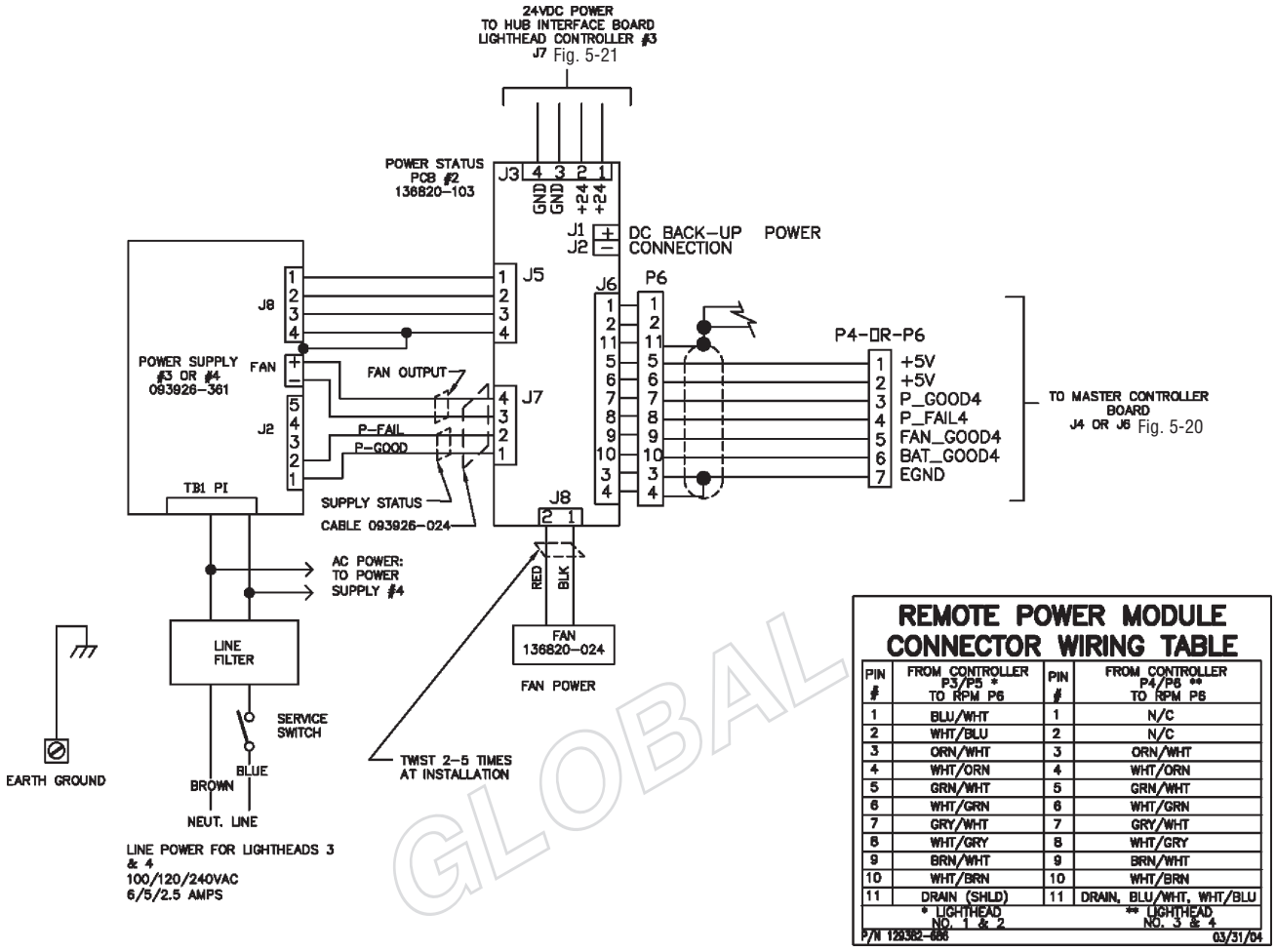


Figure 5-23. Global Remote Power Module

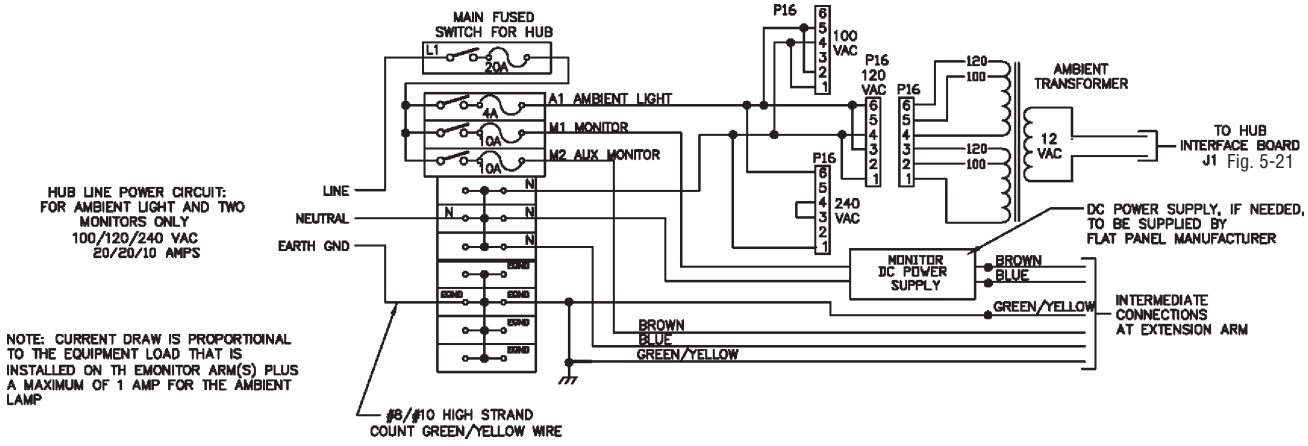


Figure 5-24. Global Hub Power Circuit

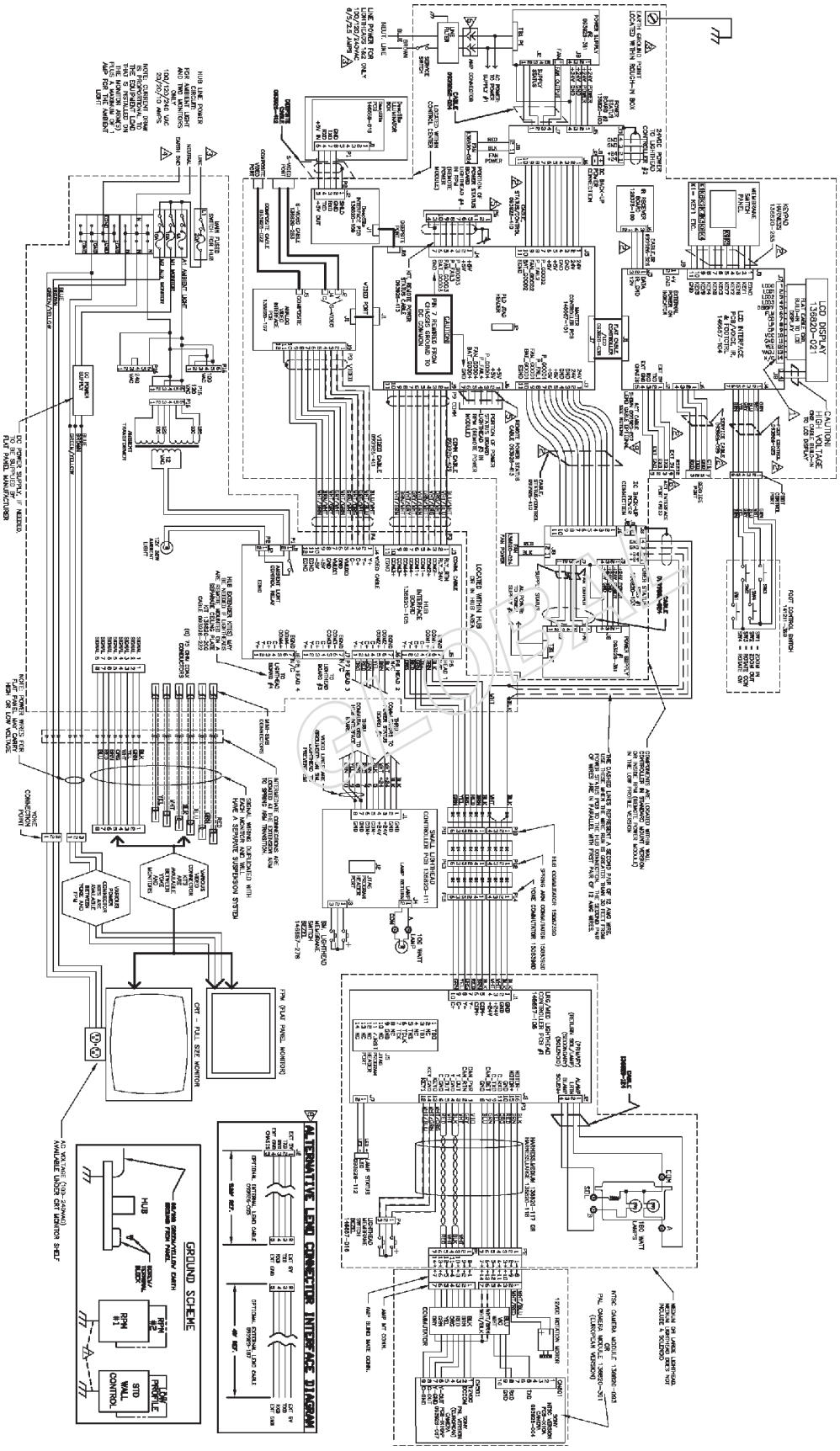


Figure 5-25. Global Schematic

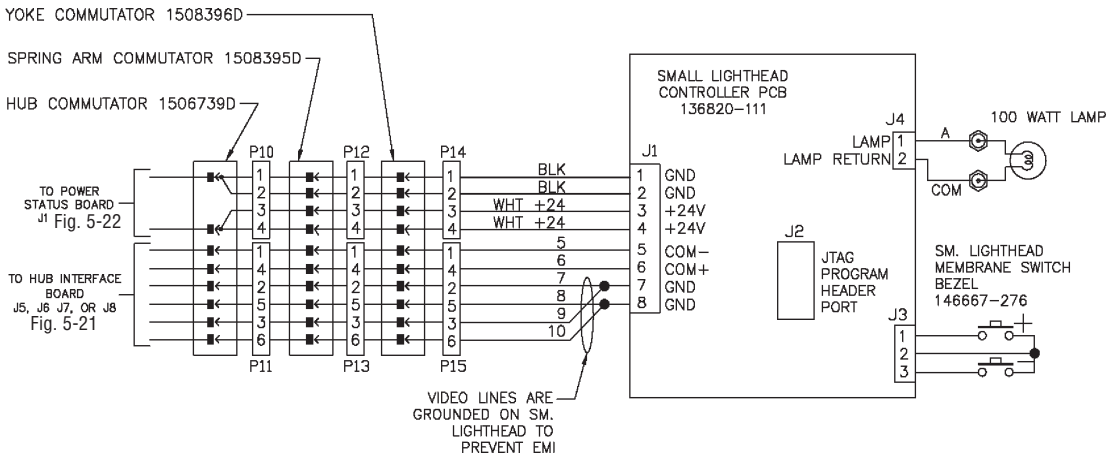


Figure 5-26. Global Small Lighthead Controller Board

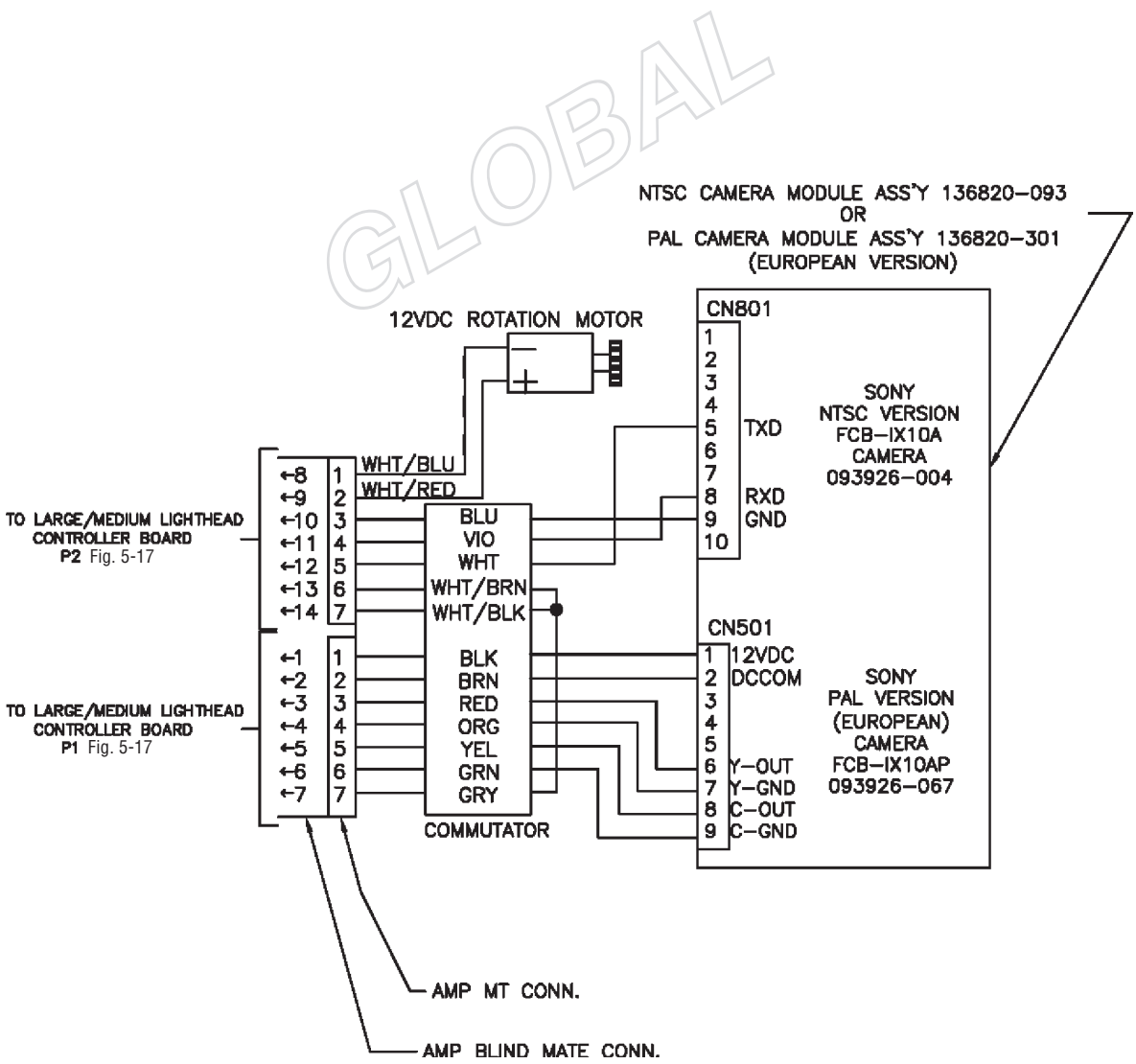


Figure 5-27. Global Lighthead Camera Module

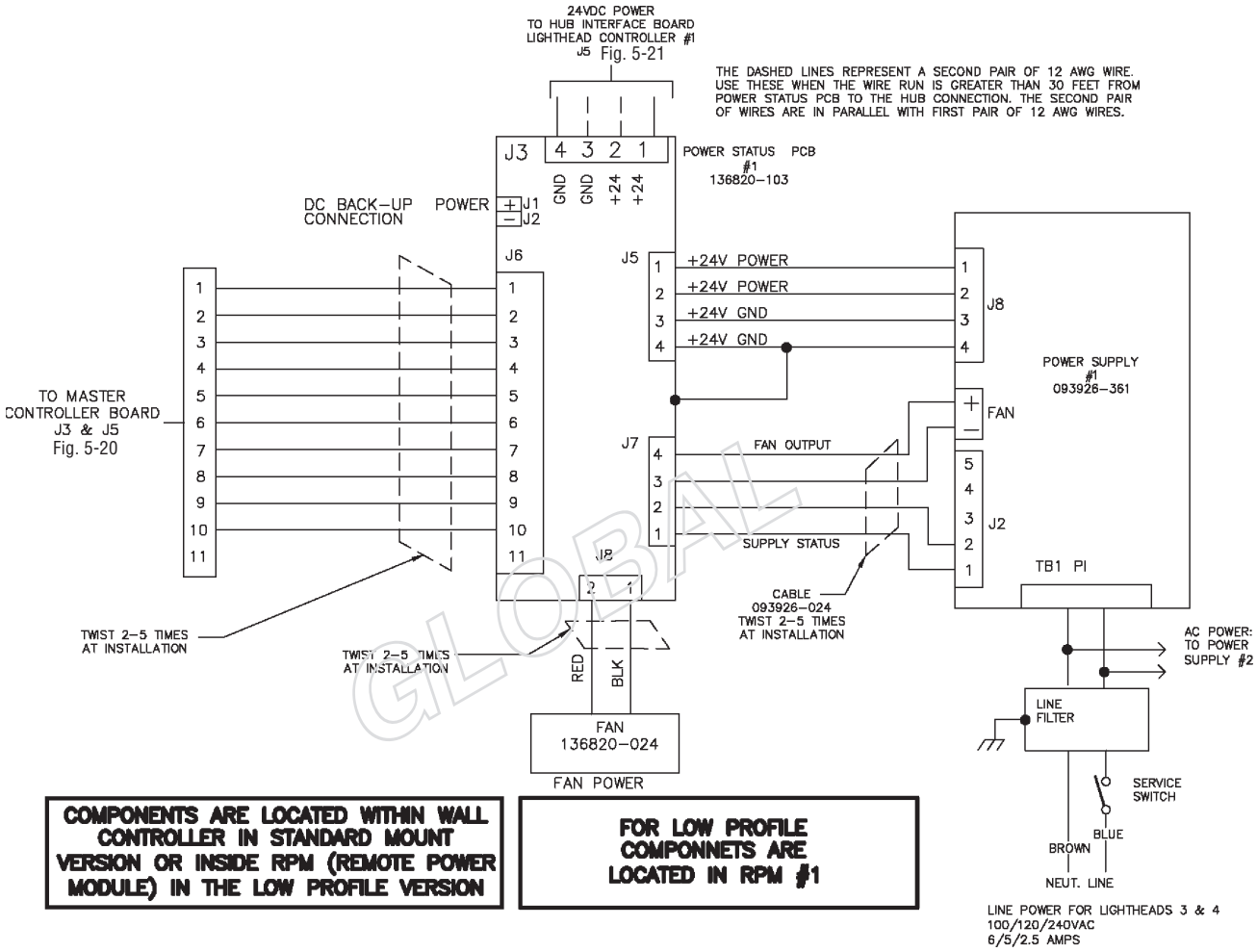

24VDC POWER
TO HUB INTERFACE BOARD
LIGHTHEAD CONTROLLER #1
J5 Fig. 5-21
THE DASHED LINES REPRESENT A SECOND PAIR OF 12 AWG WIRE. USE THESE WHEN THE WIRE RUN IS GREATER THAN 30 FEET FROM POWER STATUS PCB TO THE HUB CONNECTION. THE SECOND PAIR OF WIRES ARE IN PARALLEL WITH FIRST PAIR OF 12 AWG WIRES.
J3 4 3 2 1
GND GND +24 +24
POWER STATUS PCB #1 136820-103
DC BACK-UP POWER CONNECTION
J1
J2
J6
J5
+24V POWER
+24V POWER
+24V GND
+24V GND
J8
POWER SUPPLY #1 093926-361
FAN
J7
FAN OUTPUT
SUPPLY STATUS
J2
TB1 PI
TO MASTER CONTROLLER BOARD J3 & J5 Fig. 5-20
CABLE 093926-024 TWIST 2-5 TIMES AT INSTALLATION
TWIST 2-5 TIMES AT INSTALLATION
TWIST 2-5 TIMES AT INSTALLATION
RED
BLK
FAN 136820-024
FAN POWER
AC POWER: TO POWER SUPPLY #2
LINE FILTER
SERVICE SWITCH
BLUE
BROWN
NEUT. LINE
LINE POWER FOR LIGHTHEADS 3 & 4
100/120/240VAC
6/5/2.5 AMPS
COMPONENTS ARE LOCATED WITHIN WALL CONTROLLER IN STANDARD MOUNT VERSION OR INSIDE RPM (REMOTE POWER MODULE) IN THE LOW PROFILE VERSION
FOR LOW PROFILE COMPONNETS ARE LOCATED IN RPM #1
GLOBAL

Figure 5-28. Global Video & Power Kits

Section 6: Inspection and Maintenance

WARNING – PERSONAL INJURY HAZARD: Repairs and adjustments should be attempted only by experienced technicians fully acquainted with this equipment. Use of inexperienced, unqualified persons to work on the equipment or the installation of unauthorized parts could cause personal injury or result in costly damage.

CAUTION: Use of any disinfectant solution other than those listed below may cause discoloration or deformation on the acrylic lens surface: Germicidal Cloth, Coverage Spray HB, Coverage HB Concentrate, T.B.Q., or Coverage Plus. Cleaning solutions other than those listed have NOT been tested for compatibility or effectiveness. Always follow manufacturer instructions for concentrations and use of cleaning products.

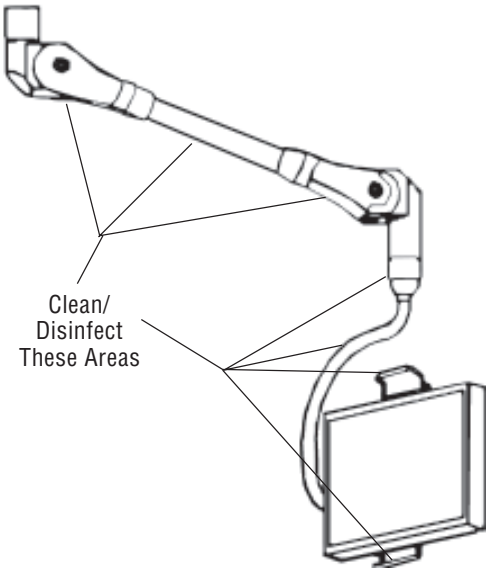
6.1 GENERAL

The maintenance and cleaning described in *Section 6.2, Cleaning the Equipment*, should be performed at intervals best determined by usage of the equipment. Should a problem occur when operating the unit, refer to *Section 6.7, Troubleshooting*. Any maintenance should only be attempted by qualified service technicians. Following repairs, test light using *Section 7, Field Test Procedure*.

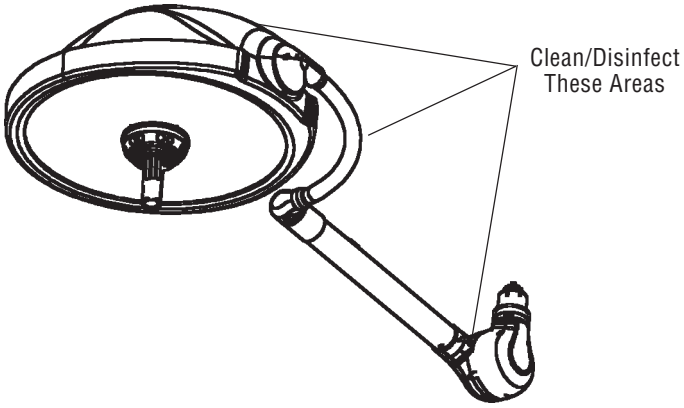
6.2 CLEANING THE EQUIPMENT

WARNING – PERSONAL INJURY HAZARD: Do not attempt to clean lighthead unless power is turned off at variable intensity controller by disengaging the circuit breaker(s) and lighthead has cooled sufficiently.

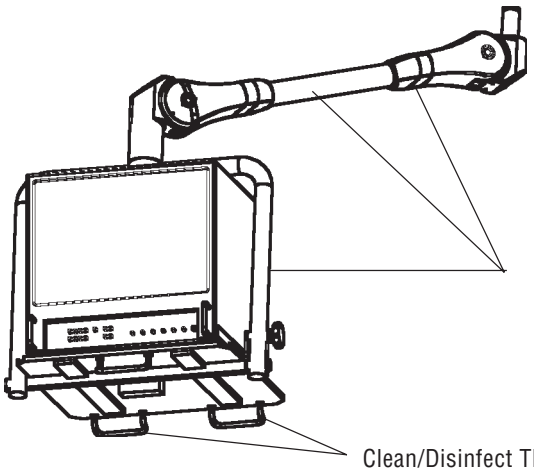
CAUTION: Use only recommended cleaning/disinfecting agents on this light. Some degree of staining, pitting, and/or discoloration could occur if a phenolic-, iodophor-, or glutaraldehyde-based disinfectant is used on the surfaces of this light. Also, use of alcohol or aerosol spray cleaner/disinfectants (e.g., Lysol®) containing a substantial amount of alcohol in the formula can damage the acrylic plastic lens.



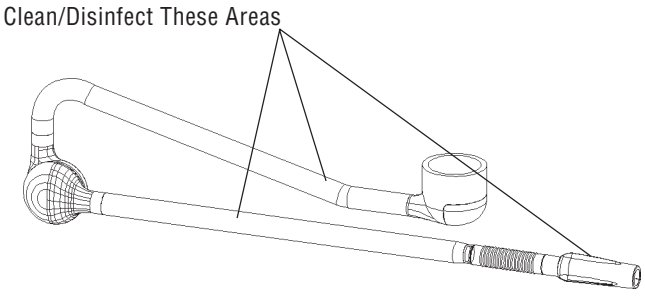
Flat Panel Monitor and Suspension Arm



Lighthead and Suspension Arm



CRT Monitor and Suspension Arm



DeepSite Lighthead and Suspension Arm

Figure 6-1. Areas To Be Cleaned

⚠ CAUTION:

- **Do not scratch optical coating on accessible portions of optical core when cleaning; always wear rubber gloves and use only a clean, white, lint-free cloth when wiping internal surfaces.**
- **Prevent leakage of fluids into interior of lighthead.**

6.2.1 Cleaning Implements

- Pail
- Sponge
- Cloth Wipes
- Rubber Gloves
- Mild Household Detergent
- Disinfectant cleaners such as:
  - » Germicidal Cloth (NK350, NK352)
  - » Coverage® Spray HB (1424-63)
  - » Coverage® HB Concentrate (1420-08)
  - » T.B.Q.® (6345-08)
  - » Coverage Plus® (6367-08)

  All listed disinfectant cleaning products for use on this equipment are available from STERIS.

6.2.2 Areas To Be Cleaned (See Figure 6-1.)

The cleaning and disinfecting procedures described in paragraph 6.2.3 apply to each of the following areas:

- **Suspension Arm** — wipe the entire suspension arm, including the suspension fork and yoke.
- **Lighthead** — Wipe both top and side surfaces (including non-sterile handles and top cover).
- **Sterile Handle Support** — Wipe all areas of the handle support, including those covered when the handle is installed.

6.2.3 General Cleaning/Disinfecting Procedure

1. Wear rubber gloves.
2. Initially, clean equipment with a sponge and a mild detergent and water solution.
3. The following cleaning/disinfecting agents are compatible with the outer surfaces of the suspension arm, yoke, lighthead and acrylic lens when used in accordance with label instructions: Germicidal Cloth, Coverage Spray HB, Coverage HB Concentrate, T.B.Q., or Coverage Plus.
3. Prepare cleaning or disinfecting solution in accordance with directions of the container labels.
4. Use a soft cloth and the cleaning solution. Thoroughly wipe the areas to be cleaned (see Figure 6-1). Make sure to wring out excess solution before wiping.
5. Rinse all surfaces with a soft cloth wipe and clear water (if required). Wring excess solution from cloth before wiping.
6. Wipe all surfaces dry with a clean, dry cloth.
7. Ensure sterile camera cover or sterile handle is sterilized between each procedure using standard hospital cycles.

6.2.4 Cleaning the Lens

Important: Clean only the exterior surface of the lens.

1. Remove the sterile handle.
2. Clean and disinfect the outer surface of the lens as outlined in *Section 6.2.3, General Cleaning/Disinfecting Procedure.*
3. Wipe the outer surface of the lens with an antistatic acrylic cleaner and soft cloth.
4. Do not re-install a sterile handle until immediately before the light is to be used in a surgical procedure. Always sterilize handle between surgical procedures.

   NOTE: Always sterilize handle between each surgical procedure using conventional hospital sterilization procedures and a standard sterilization prevac or gravity cycle.

6.2.5 Recommended Sterilization Techniques for the Metal Sterile Handle (P093184-001)

1. Handles should be double wrapped and sterilized using one of the following cycles:
   a. Prevac, 270°F, 4 minutes;
   b. Gravity, 270°F, 15 minutes; or
   c. Flash, 270°F, 10 minutes, unwrapped.

   *NOTE: The open end of the handle must always be positioned **downward** when placed in the sterilizer.*

6.2.6 Cleaning Hand-held Control

⚠ CAUTION: Do not immerse the hand-held control in fluid.

Clean the hand-held control once a day, or as needed between procedures.

1. Soak a soft cloth in a solution of water and a recommended agent. Wring the cloth until excess moisture has been eliminated.
2. Wipe all surfaces of the hand-held control, removing any accumulated debris or soil.
3. Using a clean, dry cloth, wipe the surfaces of the control until completely dry.

6.3 LAMP REPLACEMENT
(See Figures 6-2, 6-3, and 6-4)

⚠ WARNING – ELECTRIC SHOCK HAZARD: Do not remove covers or perform service other than as described in this equipment manual. Refer servicing to qualified service personnel.

⚠ WARNING – PERSONAL INJURY HAZARD: Do not attempt to replace the lamp unless power is turned off at variable intensity controller by disengaging the circuit breaker(s) and the lighthead has cooled sufficiently.

⚠ WARNING – PATIENT BURN HAZARD: Prevent patient skin and tissue burns. Potentially damaging radiant energy levels may be emitted by replacement lamps not qualified for use in Amsco surgical lights. Use ONLY Amsco replacement lamps, part number P093926-047.

6.3.1 Replace Harmony LA 500 and LA 700 Lamps

Harmony LA 500 and LA 700 lightheads are equipped with two lamps. Lamp A, called the primary, is always positioned at a point in the optic assembly to provide best focus and illumination. When lamp A (primary) fails, lamp B (backup) illuminates immediately. When the system switches from lamp A to lamp B, transmission of light to the operating table is interrupted for less than one second.

If one lamp in a Harmony LA 500 or LA 700 lighthead fails, the failure is indicated by a graphic display on the control center and by a blinking LED on the bottom of the lighthead's base. Do not allow a lighthead to operate for any length of time with only one functional lamp. Always replace a failed lamp at the earliest opportunity.

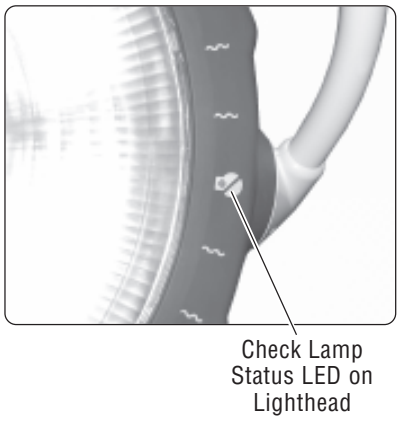


Figure 6-2.Lamp Status LED

Important: A lampholder module is accessed from the top of the lighthead and removed. Once removed, the spent lamp is replaced with a fresh lamp. Primary and secondary lamp positions are indicated on the lampholder by letter A (primary) or B (backup) on the lampholder module.

To replace a failed lamp, follow the steps outlined in the procedure below:

1. Observe the control center status screen and note which lamp has failed.

   NOTE: If fixture provides no light at all, and LED on outer cover of lighthead is blinking, check control center display to see if both lamps have failed.
2. Turn OFF the lighthead at the control center, or by using the surgeon's control buttons.
3. Rotate the lighthead until it is horizontal and in a comfortable position to reach the access hood on the top.
4. Twist the latch on the access hood to open.
5. Press down on the push-release/push-lock fasteners on the lampholder. Remove the lampholder module from the lighthead.
6. Find the failed lamp by matching the indicator mark on the lampholder:
   - For Harmony LA 500 and LA 700 lightheads, if the control center indicated that lamp “A” has failed, locate and remove lamp “A” from the lampholder.
   - For Harmony LA 700 lightheads, the primary lamp resets when extracted from the lighthead. Replace the lamp in the primary

(upper) position. (See Figure 6-3.) If the lighthead fails to provide any light, change both lamps (upper and lower positions).

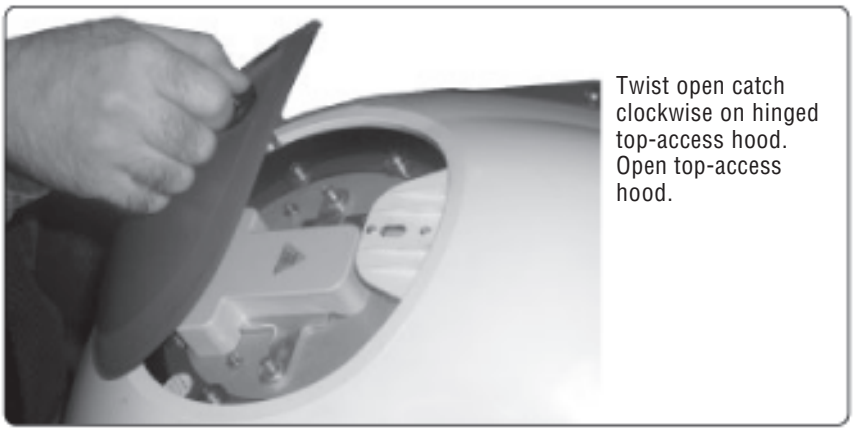
NOTE: Refer to SECTION 6.3.2, RESET HARMONY LA 700 LAMPHOLDER if lamps and lampholder are not positioned as shown in Figure 6-4.

- Remove any failed lamp(s) by grasping the lamp base in one hand and the lampholder in the other, then gently pull the lamp from the socket.

7. Grasp the new lamp by its base (remove protective wrapper, **do not** touch glass) and press into the lampholder. After replacing either lamp, inspect both lamps to verify both have intact filaments.
8. Return the lampholder to the lighthead.
   - Press the lampholder firmly into the lighthead. Press down on the push-release/push-lock fasteners to lock the lampholder in place.

   *NOTE: If the fasteners appear to be loose, they are **not locked.***

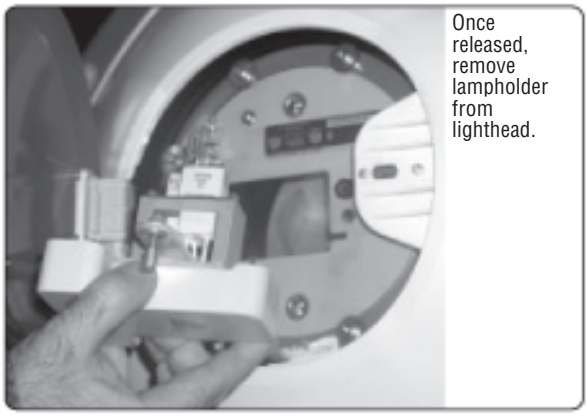
   - Firmly push straight down on the top latch located on the access hood until it locks.
9. Turn the lighthead ON.
10. Verify that the control center and lighthead lamp failure LED have changed to lamp-ready status. If the control center, or lighthead LED, continue to indicate a failed lamp, access lampholder again and examine the filament of the lamp indicated by the control center. Verify that the lamp was not damaged during the replacement procedure. An incorrectly seated lamp also indicates a failure.



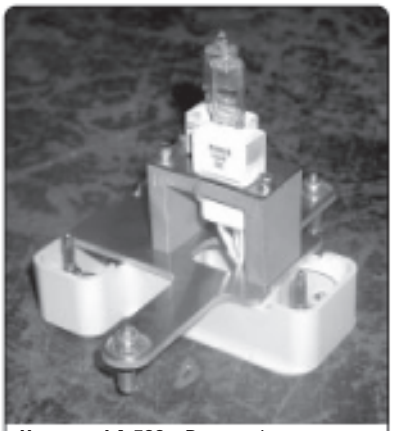
Twist open catch clockwise on hinged top-access hood. Open top-access hood.

Press and release fasteners to release lampholder.

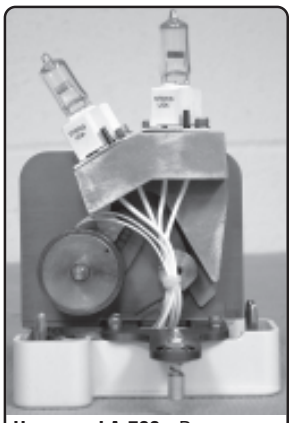
Fastener in released position.



Once released, remove lampholder from lighthead.



Harmony LA 500 – Remove lamp matching letter designation (A or B) shown on control center display. Observe handling precautions when removing or replacing lamps.



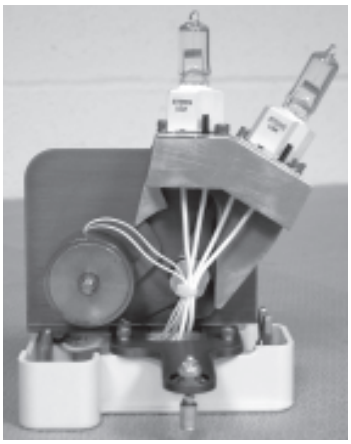
Harmony LA 700 – Remove lamp in upper position (also designated A on control center display). Observe handling precautions when removing or replacing lamps.

Figure 6-3. Lamp Replacement Procedure (Harmony LA 500 Lighthead Shown)

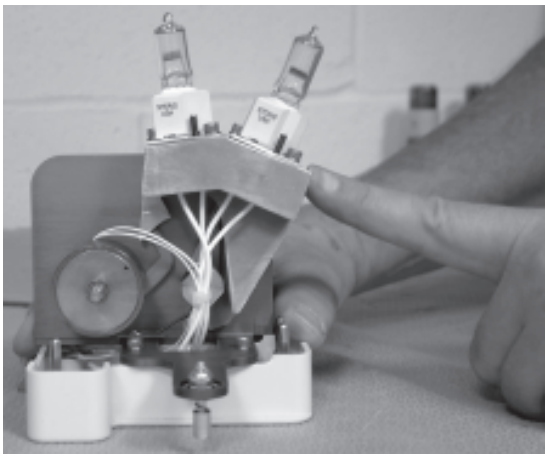
6.3.2 Reset Harmony LA 700 Lampholder

If lamp B is in the upper position when the lampholder is removed from the lighthead (see left-hand image in Figure 6-4), the lampholder must be reset before returning it to the lighthead.

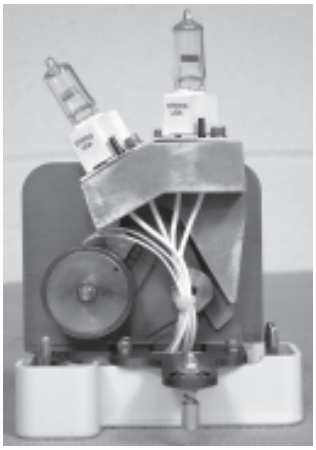
1. Place the lampholder on a flat surface and firmly support the lampholder base with one hand.
2. Press firmly on the "A" position side of the lampholder, as shown in the center image of Figure 6-4.
3. The lampholder should rest with a definite and positive motion to the position shown in the right-hand image shown in Figure 6-4.
4. Replace the lamp as necessary following the instruction in the *Section 6.3.1, Lamp Replacement: Harmony LA 500 and LA 700 Lightheads* and return the lampholder to the lighthead.



Lamp B in Upper Position



Steady Lampholder with one hand, and press A position lamp into upper position.



Lamp A in Upper Position

Figure 6-4. Reset Harmony LA 700 Lampholder Lamp Position

6.4 ROUTINE INSPECTION

1. Inspect entire installation for any signs of damage or misaligned parts.
2. Inspect ceiling hub mount to ensure ceiling fasteners are tight and that fixture is properly supported.
3. Check lighthead movement (Section 3) using both sterile and non-sterile handles. Be sure each movement is smooth and that there is no binding or drifting.
4. Check electrical components for loose wires, improper connections and other obvious defects.

   NOTE: Proper lamps are necessary to provide the focus needed to assure correct beam pattern at the operative site.

6.5 PREVENTIVE MAINTENANCE

6.6 PREVENTIVE MAINTENANCE GUIDE: SEE PAGES 6-18.

This form is to be used as a preventive maintenance record and, along with *SECTION 5* and *SECTION 6* instructions, as a guide to performing preventive maintenance.

6.7 TROUBLESHOOTING

1. Use operating instructions presented in *SECTION 3, OPERATING INSTRUCTIONS* to verify trouble symptoms.
2. After symptom has been verified, refer to **Troubleshooting Guide, Table 6-1**. From the table, select example that is most appropriate to your problem. Follow recommended correction.
3. Use Electrical Schematics (*SECTION 5*) as guide in understanding operation of the fixture and in locating problems.
4. Refer to *SECTION 8, COMPONENT REPLACEMENT AND REPAIR* for guidance when attempting repairs.

Table 6-1 Troubleshooting Guide

Display Indication	Fault	Suggested Solution
1. During system power up, display shows: LCD RAM test failure code xxxx	Control Center LCD RAM test failed.	1. Reset power to system at incoming breaker. 2. Make sure all wiring connected to display assembly ribbon cable is fully sealed. 3. If no display, replace display module. 4. Replace the control center CPU board.
2. During system power up, display shows: NVRAM test failure code xxxx	Control center non-voatile RAM test failed.	1. Reset power to system at incoming breaker. 2. Make sure all wiring connected to display assembly ribbon cable is fully sealed. 3. If no display, replace display module. 4. Replace control center CPU board.
3. User-configuration settings are lost when power is removed from the control center, and every time power is applied to the control center, during power up, display shows: Initializing NVRAM	Control center non-volatile RAM battery is dead.	Replace the control center CPU board NVRAM module.
4. During system power up, display shows: Waiting for program...	Control center FLASH memory is corrupted.	1. Reset power to system at incoming breaker. 2. Reprogram control center FLASH memory. 3. If the problem recurs, replace the control center FLASH memory.
5. After programming the control center FLASH memory, display shows: PROGRAMMING FAILED	Control center FLASH memory could not be reprogrammed.	Replace the control center FLASH memory.

Table 6-1 Troubleshooting Guide (Cont'd)

Display Indication	Fault	Suggested Solution
6. After programming the control center FLASH memory, display shows: BAD STARTUP VECTOR	Control center upload program on service technician's PC is corrupted.	Replace the control center upload program on the service technician's PC and reprogram the FLASH memory.
7. The fault indicator on the control center screen flashes and the fault log contains the following message: POWER SUPPLY OR MAINS FAILURE LIGHTHEAD 1,2,3,4	System power failure **(systems with battery back up)**	Restore AC power to the system.
8. The fault indicator on the screen flashes and the fault log contains the message: POWER SUPPLY OF MAINS FAILURE LIGHTHEAD: X *NOTE: On systems with battery back up, the battery symbol will be displayed.*	Power supply has failed on the indicated lighthead **(systems without battery back up).**	1. Ensure AC power to the supply is present. 2. Check voltage to lighthead. Voltage should be 24 VDC.
9. The fault indicator on the screen flashes and the fault log contains the message: POWER SUPPLY OR MAINS FAILURE LIGHTHEAD: X and BATTERY POWER SUPPLIED TO LIGHTHEAD: X	Power supply failure on the indicated lighthead **(systems with battery back up).**	1. Ensure AC power to the supply is present. 2. Replace the power supply.

Table 6-1 Troubleshooting Guide (Cont'd)

Display Indication	Fault	Suggested Solution
10. The fault indicator on the screen flashes and the fault log contains the message: POWER SUPPLY FAN FAULT FOR LIGHTHEAD: X	The fan on the power supply has failed.	1. Ensure fan is properly connected to power supply. 2. The wrong lighthead is connected to the main wall control (hub interface board). 3. Replace the pwer status board on the back of the wall control. 4. Replace the fan. 5. Replace the power supply.
11. The lamp-out LED on the lighthead flashes ON for one second, then OFF for one second, then repeats. The lamp-out indicator on the screen flashes and the fault contains the message: REPLACE "A" LAMP ON LIGHTHEAD: X	The primary (A) lamp has failed (burned out) in the indicated lighthead.	1. Replace the lamp. 2. The wiring inside the lighthead is loose. Inspect all wires leading to and from the lamp change assembly. (Gently tighten banana jacks.)
12. The lamp-out LED on the lighthead flashes on for one second then off for one second, then repeats. The lamp-out indicator on the screen flashes and the fault log contains the message: REPLACE "B" LAMP ON LIGHTHEAD: X	The secondary (B) lamp has failed (burned out) in the indicated lighthead.	1. Replace the lamp. 2. The wiring inside the lighthead is loose. Inspect all wires leading to and from the lamp change assembly. Gently tighten.

Table 6-1 Troubleshooting Guide (Cont'd)

Display Indication	Fault	Suggested Solution
13. The lighthead number in the light intensity bar flashes, the fault indicator on the control center screen flashes and the fault log contains the following message: COMMUNICATION FAILURE AT LIGHT-HEAD: X	The control center communication signal is not reaching the indicated lighthead.	1. Check the connections between the wall controller and the lighthead. Make sure the light head is getting 24VDC. 2. Replace the lighthead controller. 3. Replace the control center CPU board. 4. Pinched/broken communication wire in suspension. Verify continutiy of black/brown communication wires from the lighthead to the hub. 5. Use jumper wires 755717-301 and 755717-302 to jumper out sections of the suspention wiring.
14. The fault indicator on the control center display flashes and the fault log contains the following message: MAXIMUM POWER FAILURE ON LIGHT-HEAD: X	The system cannot deliver sufficient power to the lamp to achieve the desired power level.	1. Check the connections between the control center and the lighthead.Make sure the power supply output is set to 24.5VDC. 2. Shorten the wires between the power supply and the suspension system. 3. Use larger gauge wires between the power supply and the suspension system. 4. Verify lamp change wire connections are tight.
15. The fault indicator on the screen flashes and the fault log contains the following message: SWITCH FAILURE ON LIGHTHEAD: X	A surgeon's control button on the light-handle bezel is stuck in the pressed position for 12 seconds or more, or has failed.	1. Reset power at the main incoming breaker. 2. Press and release the buttons on the bezel to free the stuck button. 3. Replace the lighthandle assembly on the lighthead.
16. The lamp-out LED on the lighthead flashes ON for one second then OFF for one second, then repeats. The lamp-out indicator on the screen flashes and the fault log contains the message: "A" LAMP STARTUP FAILURE ON LIGHT-HEAD: X	The primary (A) lamp on the indicated light-head could not be successfully illuminated, but the lamp does not appear to be burned out.	1. Replace the fault and attempt to turn the light-head on again. 2. Replace the lamp. 3. Follow troubleshooting items for "Lamp Out A/B Lamps." 4. Replace the lighthead controller.

Table 6-1 Troubleshooting Guide (Cont'd)

Display Indication	Fault	Suggested Solution
17. The lamp-out LED on the lighthead flashes ON for one second then OFF for one second, then repeats. The lamp-out indicator on the screen flashes and the fault log contains the message: "B" LAMP STARTUP FAILURE ON LIGHTHEAD: X	The secondary (B) lamp on the indicated lighthead could not be successfully illuminated, but the lamp does not appear to be burned out.	1. Reset the fault and attempt to turn the lighthead on again. 2. Reset the lamp. 3. Follow troubleshooting items for "Lamp Out A/B Lamps." 4. Replace the lighthead controller. 5. If LA700, replace the lamp change solenoid.
18. The fault indicator on the screen flashes and the fault log contains the following message: REPLACE DeepSite LAMP - XXX HOURS PAST SERVICE LIFE	The DeepSite lamp controller is reporting that its lamp has exceeded the normal service life.	Replace the DeepSite lamp.
19. The fault indicator on the screen flashes and the fault log contains the following message: DeepSite THERMAL SHUTDOWN.	The DeepSite lamp controller is reporting that it has shutdown its lamp due to an over-temperature condition.	1. See service manual for DeepSite Light 764330-210. 2. Verify no Air/Dirt obstruction is preventing airflow through the illuminator box.

Table 5-2 Troubleshooting Guide

Display Indication	Fault	Suggested Solution
20. The fault indicator on the screen flashes and the fault log contains the following message: DeepSite INTER-LOCK OPEN.	The DeepSite lamp controller is reporting an interlock open condition.	1. See service manual for DeepSite Light 764330-210. 2. Verify Lamp Door Switch is functional.
21. The fault indicator on the screen flashes and the fault log contains the following message: DeepSite INTENSITY ADJUSTMENT TIMEOUT.	The DeepSite lamp controller did not respond to an intensity adjustment command in the required amount of time.	1. Check the connection between the DeepSite and the control center. 2. See DeepSite documentation. 3. Verify DeepSite motor and clutch are responding to commands.
22. The fault indicator on the screen flashes and the fault log contains the following message: SWITCH FAILURE ON THE FRONT PANEL - SW NO: X	A key on the control center front panel is stuck for eight seconds, or has failed.	1. Press and release the button to free the stuck button. 2. Customer has held a button down for too long. Reset power to wall control at the main incoming power. 3. Replace the control center front panel assembly.
23. The fault indicator on the screen flashes and the fault log contains the following message: DeepSite COMMUNI-CATION FAILURE.	The control center cannot communicate with the DeepSite lamp controller.	1. Check the connection between the DeepSite and the controller. 2. See DeepSite documentation for recommended action. 3. Replace the DeepSite controller. 4. Replace the control center CPU board.
24. Display contrast makes characters illegible.		1. The contrast button has been scrolled too far or not far enough. Press contrast button to the right only (not backward).
25. No display or smoke from behind display.		1. Pinched wires(s) somewhere in suspension system. 2. Use jumper wires 755717-301 and 755717-302 to jumper out sections of the suspension wiring.

Table 6-1 Troubleshooting Guide (Cont'd)
(Video Camera Module Errors)

Display Indication	Fault	Suggested Solution
26. The fault indicator on the screen flashes and the fault log contains the following message: CAMERA COMMUNICATION FAILURE ON LIGHTHEAD: X	The indicated lighthead cannot communicate with the installed camera.	1. Remove and re-install the camera module. 2. Replace the camera module. 3. Replace the lighthead controller.
27. The fault indicator on the screen flashes and the fault log contains the following message: CAMERA MOTOR ROTATION OVER CURRENT ON LIGHTHEAD: X	The camera's rotation motor is drawing excessive current when activated.	1. Remove/replace camera module from lighthead. Verify no mechanical obstructions within camera. 2. Replace the video camera module.
28. The fault indicator on the screen flashes and the fault log contains the following message: MULTIPLE CAMERAS DETECTED ON LIGHTHEADS: X, Y	More than one lighthead is reporting that it has a video camera module installed.	1. Remove video camera modules from all but a single lighthead. 2. Replace lighthead controller reproting camera is installed where camera is not installed.

Table 6-1 Troubleshooting Guide (Cont'd)
(Lighthead Controller Errors)

Display Indication	Fault	Suggested Solution
29. The control center is unable to communicate with the lightheads and the lighthead lamp-out LED flashes twice, remains OFF for three seconds, flashes twice, then repeats.	Lighthead control external oscillator failure.	1. Pinched wire(s) somewhere in suspension system. 2. Use jumper wires 755717-301 and 755717-302 to jumper out sections of the suspension wiring. 3. When a lamp fails in the shorted condition (lamp reweld), the lighthead board can be destroyed. Check lamp condition before replacing any lighthead boards. 4. Replace the lighthead controller board.
30. The control center is unable to communicate with the lighthead, lamp-out LED on the lighthead flashes three times, remains off for three seconds, flashes three times, then repeats.	When power is applied to the lighthead, neither the lighthead application or the lighthead boot loader program are intact on the lighthead controller.	1. Pinched wire(s) somewhere in suspension system. 2. Use jumper wires 755717-301 and 755717-302 to jumper out sections of the suspension wiring. 3. When a lamp fails in the shorted condition (lamp reweld), the lighthead board can be destroyed. Check lamp condition before replacing any lighthead boards. 4. Replace the lighthead controller board.
31. The control center is unable to communicate with the lighthead and the lighthead lamp-out LED flashes four times, remains off for three seconds, then repeats.	When power is applied to the lighthead, the lighthead boot program CRC is invalid.	1. Pinched wire(s) somewhere in suspension system. 2. Use jumper wires 755717-301 and 755717-302 to jumper out sections of the suspension wiring. 3. When a lamp fails in the shorted condition (lamp reweld), the lighthead board can be destroyed. Check lamp condition before replacing any lighthead boards. 4. Replace the lighthead controller board.

Table 6-1 Troubleshooting Guide (Cont'd)
(Lighthead Controller Errors)

Display Indication	Fault	Suggested Solution
32. The control center is unable to communicate with the lighthead and the lighthead lamp-out LED flashes five times, remains off for three seconds, then repeats.	When power is applied to the lighthead, the lighthead power-on self test fails.	1. Pinched wire(s) somewhere in suspension system. 2. Use jumper wires 755717-301 and 755717-302 to jumper out sections of the suspension wiring. 3. When a lamp fails in the shorted condition (lamp reweld), the lighthead board can be destroyed. Check lamp condition before replacing any lighthead boards. 4. Replace the lighthead controller board.
33. The control center is unable to communicate with the lighthead and the lighthead lamp-out flashes six times, remains off for three seconds, then repeats.	The lighthead controlled detects an invalid interruption.	1. Pinched wire(s) somewhere in suspension system. 2. Use jumper wires 755717-301 and 755717-302 to jumper out sections of the suspension wiring. 3. When a lamp fails in the shorted condition (lamp reweld), the lighthead board can be destroyed. Check lamp condition before replacing any lighthead boards. 4. Replace the lighthead controller board.
34. No video signal to flat panel monitor.	Wiring fault.	1. Check video cable integrity with phase 1 video test kit P764331-738 and volt meter. 2. Relace applicable suspension system components.
35. Wall control locks up occasionally, no buttons can be pushed to make control respond.	Electrical noise in system.	1. Reset main incoming power (cycle power on/off. 2. Verify latest software download into wall control, Revision 10 or higher.

Table 6-2. Harmony Lighting and Visualization System Preventive Maintenance Guide

Maintenance to be Performed	Minimum Frequency *
NOTE: Do not touch lamp glass with bare fingers. Skin oils and grease are detrimental to lamp life.	
1.0 Inspection Preparation	Each inspection
1.1 Meet with facility staff.	Each inspection
1.2 Check overall lighting system for appearance, visual damage, or missing parts.	Each inspection
1.3 Follow appropriate safety precautions • For Major inspection, proceed to section 2.0. • For Minor inspection, proceed to Step 3.0	Each inspection
2.0 Requirements for Major Inspection (Lighthead #1)	Each inspection
2.1 With power off, remove the knuckle covers. Check wiring in lighthead/yoke interface for routing and chafing. Make sure all connections are tight. Repeat for connectors in other knuckle areas.	Each inspection
2.2 Replace secondary lamp with a new lamp.	Each inspection
2.3 Verify intensity and optical patterns of light	Each inspection
2.0A Requirements for Major Inspection (Lighthead #2, dual-lighthead systems)	Each inspection
2.1A With power off, remove the knuckle covers. Check wiring in lighthead/yoke interface for routing and chafing. Make sure all connections are tight. Repeat for connectors in other knuckle areas.	Each inspection
2.2A Replace secondary lamp with a new lamp.	Each inspection
2.3A Verify intensity and optical patterns of light	Each inspection
2.0B Requirements for Major Inspection (for Monitor-arm equipped systems)	Each inspection
2.1B With power off, remove the knuckle covers. Check wiring in monitor/yoke interface for routing and chafing. Make sure all connections are tight. Repeat for connectors in other knuckle areas.	Each inspection
2.2B Check for overall condition of arm; loose fasteners, and knuckle cover security.	Each inspection
3.0 Equipment Checkout (all inspections) (Lighthead #1)	Each inspection
3.1 Turn light on and verify light operation through all intensities. Leave light on at maximum intensity.	Each inspection
3.2 Fully articulate light about each pivot point (with light at maximum intensity); verify range of motion, ease of movement, and that light does not flicker. Check that light does not drift when positioned. Tighten brake, if required. a. Center hub b. Outer Spindle c. Suspension spring arm, upper d. Suspension Spring Arm, lower e. Lighthead	Each inspection
3.3 Verify smooth rotation of the patters size change system.	Each inspection
3.4 Check condition of lens for cracks, scratches or other imperfections.	Each inspection
3.5 Lamp change mechanism. Check for loose or missing push fasteners; replace as required.	Each inspection
3.6 Check lamp sockets, bulbs, and banana jacks for signs of arcing. Gently tighten wires leading to banana jacks	Each inspection
** Minimum frequency of inspection is twice a year.*	

Table 6-2. Harmony Lighting and Visualization System Preventive Maintenance Guide (Cont'd)

Maintenance to be Performed	Minimum Frequency *
3.7 Verify use of STERIS lamps.	Each inspection
3.8 Check lamp change function by removing primary lamp, then turning on power. Check to make sure secondary lamp turns on and lamp out indicator blinks both on the lighthead and at the control center. Reinstall primary lamp.	Each inspection
3.9 Verify that the sterile handle mount seats firmly and latches securely on the mount.	Each inspection
3.10 Remove control center cover. Check connectors for signs of arcing, deterioration, or looseness. Tighten and loose connections (line filter power, control connectors, etc.). Check alarm log. Reinstall control center cover.	Each inspection
3.11 Verify light has the proper labels in the correct locations.	Each inspection
3.12 Reinstall all covers.	
4.0A Equipment checkout (all inspections, lighthead #2 for dual lighthead systems)	Each inspection
4.1A Turn light on and verify light operation through all intensities. Leave light on at maximum intensity.	Each inspection
4.2A Fully articulate light about each pivot point (with light at maximum intensity); verify range of motion, ease of movement, and that light does not flicker. Check that light does not drift when positioned. Tighten brake, if required. a. Center hub b. Outer Spindle c. Suspension spring arm, upper d. Suspension Spring Arm, lower e. Lighthead	Each inspection
4.3A Verify smooth rotation of the patters size change system.	Each inspection
4.4A Check condition of lens for cracks, scratches or other imperfections.	Each inspection
4.5A Lamp change mechanism. Check for loose or missing push fasteners; replace as required.	Each inspection
4.6A Check lamp sockets, bulbs, and banana jacks for signs of arcing. Gently tighten wires leading to banana jacks	Each inspection
4.7A Verify use of STERIS lamps.	Each inspection
4.8A Check lamp change function by removing primary lamp, then turning on power. Check to make sure secondary lamp turns on and lamp out indicator blinks both on the lighthead and at the control center. Reinstall primary lamp.	Each inspection
4.9A Verify that the sterile handle mount seats firmly and latches securely on the mount.	Each inspection
4.10A Remove control center cover. Check connectors for signs of arcing, deterioration, or looseness. Tighten and loose connections (line filter power, control connectors, etc.). Check alarm log. Reinstall control center cover.	Each inspection
4.11A Verify light has the proper labels in the correct locations.	Each inspection
4.12A Reinstall all covers.	Each inspection
5.0 Final Check-out	Each inspection
5.1 Clean area.	Each inspection
5.2 Meet with customer.	Each inspection

** Minimum frequency of inspection is twice a year.*

Section 7: Field Test Procedure

7.1 GENERAL

The Harmony™ LA Surgical Lighting and Visualization System must be tested and inspected accoring to the following procedures on initial start-up or whenever an adjustment or repair has been made. Keep a record of the test. Each test must meet the standards of material, workmanship, and performance set forth in this procedure. Refer to Section 6, *Inspection and Maintenance,* should problems arise or adjustments be required.

7.1.1 Special Tools Required

The following special tools are required to work on the Harmony LA Surgical Lighting and Visualization System;

Special Tools:

1. **Metric Allen wrench set , P764324-655.** Previously released, not a special tool, but required for working on Harmony LA suspension systems.
2. **Spanner wrench, ceiling plate, P764330-544.** A spanner wrench used to tighten the wedge locking nut of the ceiling plate. Instructions for obtaining final torque of the lock nut are included in the newest installation instructions and the upcoming service manual.
3. **Spanner wrench, spring arm, P764330-533.** A spanner wrench used for tightening the spring arms onto the main suspension system.
4. **Snap ring pliers, P764330-502.** A pair of large snap ring pliers used for removing the snap ring located within the Harmony Suspension system. Tool is required for removing/replacing main suspension commutators and removing Horizontal Arms.
5. **Direct readout digital light meter, P764330-525.** A new light meter, replaces analog readout dial light meter. Allows a digital display readout directly from the meter itself (lux or footcandle). No cross reference table is required to interpret the readings from the meter.
6. **Wiring harness, dc power, P755717-301.** A test wiring Harness used for jumper-ing out sections of the DC power wiring within the suspension system (heavy black and white wires) for troubleshooting purposes only. Can also be used to provide a new connector end in the event of a connector/ pin breakage. (4 plug/4 wire harness)
7. **Wiring harness, communication wires, P755717-302.** A test wiring Harness used for jumper-ing out sections of the communication/video wiring within the Harmony suspension systems (for troubleshooting purposes only). Can also be used to provide a new connector end in the event of a connector/ pin breakage. (6 position plug/6 wire harness).
8. **Meter leads, retractable, P764330-228.** Additional meter leads for Fluke 87 Volt/Ohm Meters. Meter leads have very small/fine wire tips and are useful in probing/testing circuits that contain very fine wires and small electrical plugs. May be useful on other products as well as Harmony Lights.
9. **SMB test harness, P755717-334.** A Test Harness for the coaxial video cables. Allows the video system to be tested outside of the arm to detect video problems. Makes troubleshooting the video system possible.
10. **SMB repair kit, P764330-746.** A repair kit that allows the replacement of SMB connectors. Allows the connectors to be removed/replaced in the field. Provides SMB connectors, crimping tools, special tools and installation instructions necessary to install these connectors.
11. **Test harness, 8-pin, monitor suspension arm, P755717-352.** Allows the monitor wiring to be tested/ jumpered out in the suspension arm. Provides a temporary means to route signals to the outside of the arm. Allows for troubleshooting of the video system.
12. **Test harness, 8-pin, monitor spring arm, P755717-353.** Allows the Monitor spring arm wiring to be jumpered out. Provides a temporary means to route signals to the outside of the monitor spring arm. This test Harness can be used to check/verify the wiring between the knuckle and yoke connections when troubleshooting the video system.
13. **Phase 1 video test kit, P764331-738.** A hand held continuity tester, required to check the integrity of the video wiring. Required for installing the video system arms in the field.
14. **Phase 2 video test and repair kit, P764332-085.** A kit that includes NTSC signal generator, hand held monitor, and various video adapter kits. Kit also includes SMB crimping tools and connectors, and soldering equipment to install s video connectors in the field.
15. **Video Verification Kit 764332-116.** A kit that includes NTSC generator, hand held LCD monitor and various adapters only. Allows a video signal to be inputted to the video cabling on one end, and viewed on the other end of the cabling with the hand held monitor. This kit is a more advanced installation kit, where an actual video

signal can be displayed from either the Harmony LA camera onto the monitor, or the signal generator can transmit to the hand held monitor. Allows video verification, with video picture, upon installation or troubleshooting of the Harmony lights.

16. **Triage cable, P764332-162.** Allows the entire video cabling to be bypassed in the event of a cabling failure. Can be tie wrapped to the outside of an arm system if internal video cabling fails. Temporary repair until the arm system can be repaired / replaced.
    - Tape Measure
    - Common hand tools

7.2 SCOPE

Use the procedures in this test to verify lighthead is performing within specifications.

7.3 GENERAL TEST

Visually inspect wire routing through yoke pivot interface and ensure proper position. Allowing wiring to remain in improper position can pinch and damage wiring, leading to general lighthead failure. See Figure 7-1.

Figure 7-1. Inspect Wire Routing

Inspect general apperance, such as condition of painted surfaces, trim ring fit, etc.

Inspect all labels for correct location and defects (e.g., bubbles, illegibility, peeling edges, etc.).

Inspect hood latch operation, verify hood fits properly. Observe hood operation, ensuring proper function.

Ensure ceramic lampholder is tightly secured to frame. Any movement of ceramic lampholder relative to frame indicates failure.

Verify proper fit and alignment of lampholder assembly within the lighthead.

Make sure light is "ON" for at least 1/2 hour before proceeding.

7.4 MECHANICAL TEST

Rotate the pattern change mechanism both clockwise and counterclockwise. Observe if rotational motion is smooth. If any resistance is felt, inspect the unit for improper assembly or damaged components, then retest. See *SECTION 8, COMPONENT REPAIR AND REPLACEMENT*, for adjusting of lens clips if needed.

7.5 OPTICAL TEST (HARMONY LA 500 & 700)

CAUTION: Do not handle lamps with bare hands. Oils and contaminants can cause shattering of the glass envelope.

CAUTION: Lamps used for testing must be handled with extreme care. Glass envelope and ceramic base will cause severe burns.

1. Turn OFF the light and allow the lamp to cool.
2. Remove the primary lamp and verify the installation of the back-up lamp assembly.
3. Turn ON fixture and set intensity to maximum. Verify that the lamp out indicator flashes on both the lighthead and the control center screen.
4. Place the light meter on a flat surface and position the lighthead directly over it. Set the distance between the two at one meter (39-3/8"). See Figure 7-2.

Figure 7-2. Place Light Meter on Table

5. Secondary Lamp – Small Pattern:
   a. Rotate lighthandle to obtain small pattern (counterclockwise rotation). Adjust light meter position within pattern to read peak illuminance.
   b. Verify lamp back-up mechanism repositions the secondary lamp.
6. Harmony LA 500 Lighthead:
   a. Read the peak illuminance as viewed from the light meter. The value will be approximately 60% of the total light output measured from the primary lamp.
   b. Re-install the primary lamp and remove the secondary lamp. Allow lamps to cool before touching.
7. Primary Lamp – Small Pattern:
   a. Turn on the light by pressing and holding the "+" surgeon's control button. Verify light turns on by pressing "+" surgeon's control button, then off by pressing the "-" button. Verify lamp out indicator is flashing to indicate secondary lamp failure. Repeat on/off testing for each pair of "-/+" buttons on the control bezel.

      NOTE: If a button is held longer than two seconds, the lighthead turns off.

   b. Visually verify all changes in illuminance levels.
8. Reinstall All Lamps:
   a. Readjust light meter position to locate point of peak illuminance. Reposition lighthead to one meter distance from light meter (required for accurate testing), then use the Illuminance Probe to locate point of peak illuminance.

      Peak illuminance must fall within the ranges listed below:

      - Harmony LA 500 Lighthead:
        - » 9,500 fc, minimum – 14,800 fc, maximum.
        - » Optimal Target: 12,000 fc
      - Harmony LA 700 Lighthead:
        - » 14,000 fc minimum–14,860 fc maximum
        - » Optimal Target: 14,500 fc

   b. Starting at the point of peak illuminance (pattern center), move the light meter by hand toward the edge of the pattern. Ensure the illuminance decreases continuously from center to edge. For example, illuminance readings resulting in a drop with a rise followed by another drop indicates a dark band within the pattern. Such bands are a cause for investigation.
   c. Measure the size of the small pattern using tape measure. Small pattern size should be approximately 5-1/2" x 6-1/2" (not round) in diameter.
9. Primary Lamp – Large Pattern Size:
   a. Rotate Lighthandle to obtain large pattern.
   b. Measure diameter of large light pattern using tape measure.
      - Harmony LA 500 Lighthead: 10" (254 mm) pattern diameter.
      - Harmony LA 700 Lighthead: 12" (254 mm) pattern diameter.

7.6 SUSPENSION SYSTEM FIELD TEST PROCEDURE

1. Verify overall condition of lighting suspension system. Check for loose or missing screws, loose knuckle covers, and missing or cracked knuckle covers.
2. With control center on and lighthead on, articulate lighthead and suspension arms through all ranges of motion. Verify lighthead does not flicker at any point during articulation.

Figure 7-3. Verify Star Washer Engagement

3. Verify smooth articulation of suspension system through all ranges of motion. Check equipment drawing for allowable ranges of motion.
4. Check for excessive drift of each lighthead or monitor arm at all locations. Begin testing at the center mount and work outward to each lighthead or monitor.
5. Adjust the brake screw tension equally at each individual location. Turn both brake screws 1/8 to 1/4 of a rotation to adjust the amount of drift. See *SECTION 8, COMPONENT REPAIR AND REPLACEMENT.*
6. Verify that spring arms have a neutral feel to them when raised or lowered. The spring arm should not

have a tendency to rise or fall unaided. Adjust spring arm tension on the spring arms as necessary. See *SECTION 8, COMPONENT REPAIR AND REPLACEMENT*.

7. Lower canopy away from ceiling and verify the following items:
   a. Verify star washer in wedge area has one of its tabs locked down into the groove of the lock nut.
   b. Verify all four safety ring locking pins are present and installed (i.e., fully engaged into the safety ring and vertical tube).

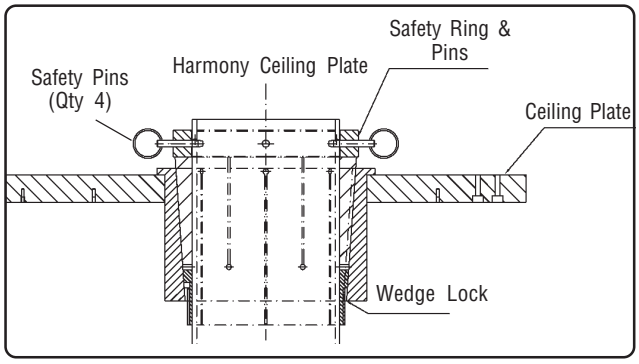


Figure 7-4. Check Safety Ring and Safety Ring Pins

   c. Verify hub interface board is securely mounted to the Harmony ceiling plate. Verify all connectors are fully seated in the interface board and lighthead power wires are securely wire-nutted together.

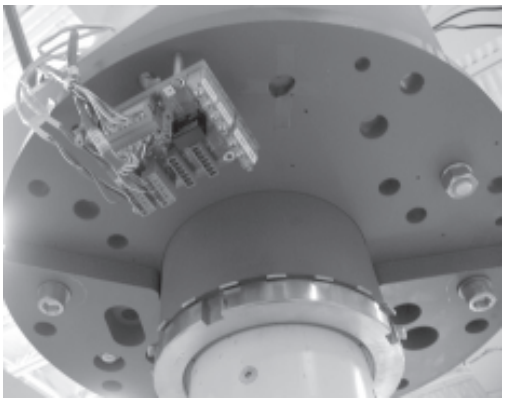


Figure 7-5. Check Hub Insterface Board Mounting and Connections

   d. Verify that all ground wires are attached to the ground screw located on the ceiling plate.
   e. Verify that all wires leading to the fuse block are secure and that the fuse block itself is securely mounted to the ceiling plate (if monitors used).

8. Reinstall canopy when inspections are complete.

7.7 WALL CONTROL FIELD TEST PROCEDURE

Carefully and thoroughly inspect the Harmony control center and DC power supply as follows:

1. Inspect general appearance, such as condition of painted surfaces, control cabling, etc.
2. Inspect all labels for correct location and defects (e.g., bubbles, illegibility, peeling edges, etc.).
3. Inspect components, verifying proper fit and function of covers.
4. Ensure viewing area of display screen is free from surface imperfections.

⚠ WARNING – SHOCK AND BURN HAZARD: Do not touch the components or equipment while testing is in progress.

5. Remove control center and/or DC power supply covers.
6. Verify rotation of each power supply fan.
7. Restrict the rotation of each power supply fan, observing control center display for indication fault. Clear fault in fault log.
8. Actuate buttons on the control center membrane keypad to verify function (left, right, up, down, ambient, menu, on, and off).
9. Measure the output DC voltage from each power supply with the lights off and the control center power on. Voltage should be 24.5 VDC. See *SECTION 8, COMPONENT REPAIR AND REPLACEMENT*, if voltage adjustment is required.
10. Reinstall covers.

Section 8: Component Repair and Replacement

WARNING - PERSONAL INJURY HAZARD: Repairs and adjustments should be attempted only by experienced technicians fully acquainted with this equipment. Use of inexperienced, unqualified persons to work on the equipment or the installation of unauthorized parts could cause personal injury or result in costly damage.

CAUTION: To prevent voiding the warranty or damaging the equipment, use only STERIS replacement parts.

8.1 BRAKE ADJUSTMENT (ALL LOCATIONS)

1. Loosen up both adjustment screws simultaneously. On spring arms, make sure the inner brake screw holes line up with the outer brake screw holes.
2. Check the drift of the arm that is under adjustment.
3. Tighten the brake screws simultaneously and equal amount and re-test the drift of the suspension arm. Do Not simply adjust one screw and not the other.
4. Continue adjusting in this manner, working from the center of the light outward.

Figure 8-1. Adjust Lighthead/Yoke Brake Tension

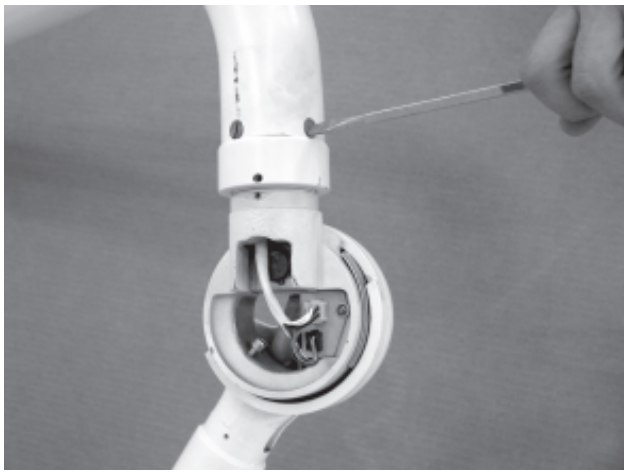


Figure 8-2. Adjust Support Arm/Spring Arm Brake Tension

Figure 8-3. Adjust Spring Arm/Yoke Brake Tension

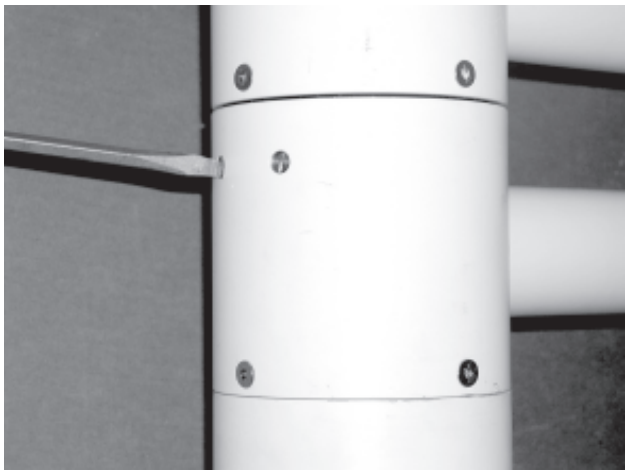


Figure 8-4. Adjust Upper Support Arm Brake Tension

8.2 LIGHT OR MONITOR SPRING ARM SPRING TENSION ADJUSTMENT

8.2.1 LIGHT SPRING ARM

1. The spring arm tension adjustment is needed whenever the spring arm has a tendency to drift downward or upward.
2. The adjustment cover is located on top of the spring arm, facing the ceiling.

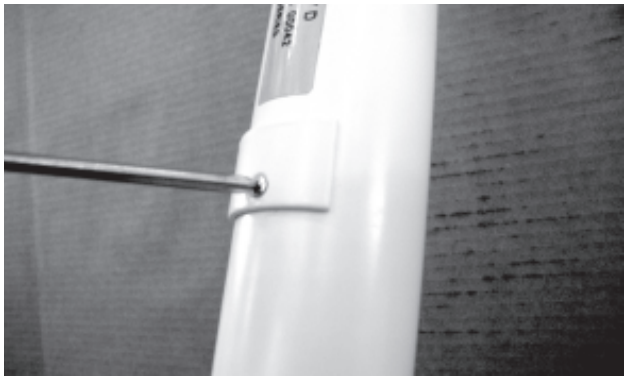


Figure 8-5. Remove Cover to Access Spring Arm Tension Adjustment

3. Remove the two screws and cover. (See Figure 8-5.) Locate the adjustment ring with holes in it underneath.
4. Turn the adjuster clockwise with the appropriate size allen wrench or pin punch (when viewed from the light head) to increase spring tension. This will cause the light head to have more of a tendency to raise up away from the surgical table. Turning the adjuster counterclockwise creates the opposite effect. (See Figure 8-6.)

Figure 8-6. Adjust Spring Arm Tension

5. Re-install cover using LOCTITE® 242™* on all screws, P129377-290.

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8.2.2 MONITOR SPRING ARM

1. Adjustment for monitor spring arm is located beneath the set of knuckle covers closest to the yoke.

Figure 8-7. Monitor Spring Arm Tension Adjustment Access

8.3 COMMUTATOR TROUBLESHOOTING

1. The continuity of the commutator and entire wiring system can give an indication of the health of the commutators. The entire lighthead wiring harness within the suspension system can be continuity tested with a digital volt meter. Check continuity from the lighthead all the way back to the power status board on the hub, test continuity on all the individual wires. Continuity can also be tested from the power status board all the way back to the main control module. When testing the continuity, articulate/move each joint in the suspension system in an attempt to simulate actual movement of the light.
2. DC power is carried through the four pin connector on the wiring harness. The wire identification colors are black and white, black is negative and white is + 24 V dc. A loss of 24 V dc at the lighthead causes the light to not turn on ***and*** cause a communication loss as explained at the control center with that light head. If necessary, use test wiring harness 755717-301 to jumper out sections of the suspension system to isolate problems.
3. Lighthead communication function with the control center is communicated through the six-pin multiple wire color connector. The black and brown wires transmit the data communication signal to and from the control to the lighthead. A loss of continuity in either of these wires causes the lack of communication message at the control center.

However, the lighthead still functions when commanded on and off at the membrane switch on the lighthead. If necessary, use test wiring harness P755717-302 to jumper out sections of the suspension system to isolate problems.

4. A problem with the wiring to the camera in the lighthead can occur on the yellow, green, orange or red wires. If necessary, use test wiring harness P755717-302 to jumper out sections of the suspension system to isolate problems.
5. If a data communication problem exists and the problem is traced to a broken black or brown wire, then another color wire on the same connector may be substituted to carry the data communication signal. This should be considered a temporary means to repair the system until a new commutator is ordered and installed (see commutator replacement). A problem with the dc power wires should not be routed through the video lines since they can not handle the additional current of running a lighthead.

8.4 KNUCKLE COVER REMOVAL (ANY) AND ASSEMBLY

1. Remove the screw securing the knuckle covers together. Set aside, the screws are not captive.
2. Gently pry the halves of the covers apart using a small flat-blade screwdriver. Inch the screwdriver along the seam gently, until the cover halves separate.
3. Re-install the covers by gently snapping the sections together.
4. The screw must be secured into the knuckle covers with LOCTITE® 242™* (STERIS part number P129377-290) or equivalent.

8.5 DE-INSTALL HARMONY LA 500 LIGHTHEAD FROM THE SUSPENSION ARM

⚠ **WARNING – IMPACT HAZARD:Do not remove tension screw from the spring arm joint until the lighthead has been securely installed onto the spring arm. Note: This waring applies at both installation and de-installation procedures.**

1. Remove knuckle covers in four areas:

NOTE: 24Vdc ELECTRICAL POWER IS ALWAYS PRESENT AT THE LIGHTHEAD AND INSIDE THE CONTROL MODULE, EVEN WHEN THE LIGHTS ARE OFF.

a. Turn OFF electrical power at the rocker switch inside of the harmony control (see Figure 8-8) *or* at the customer's wall breaker.

Figure 8-8. Harmony Wall Control ON/OFF Switch

b. At the elbow of the spring arm (four covers).

c. At the lighthead (two covers).

d. At the yoke to spring arm transition (two covers).

2. Carefully unfold the excess cabling from the area of the yoke to spring arm transition. Push the excess cabling down toward the lighhead and the electrical connectors. At the same time, pull the electrical connectors out of the yoke area near the lighthead.

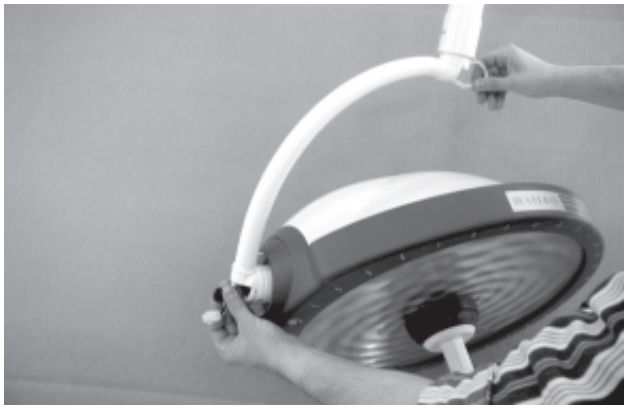

Figure 8-9. Push Spring Arm and Lighthead Toward Floor

3. Disconnect the two electrical connectors.
4. Push the spring arm and lighthead all the way down toward the floor. (See Figure 8-9.)

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5. Remove the safety screw from its storage location in the knuckle (elbow) area.
6. Install the safety screw in its location to lock the spring arm in place. (**This is very important!**)

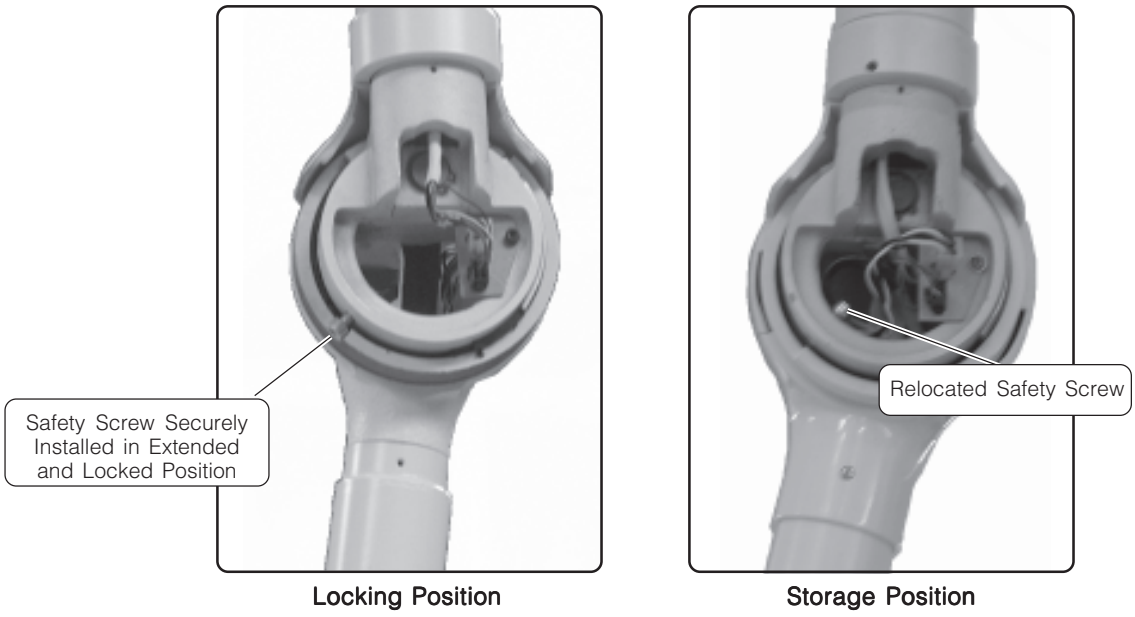

Safety Screw Securely Installed in Extended and Locked Position
Relocated Safety Screw
Locking Position
Storage Position

Figure 8-10. Safety Screw Locations

7. Support the lighthead to keep it from falling. Remove the four screws that hold the lighthead in place.

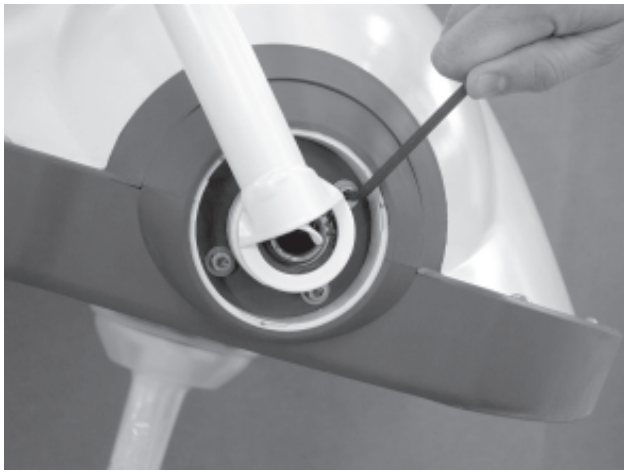


Figure 8-11. Remove Lighthead

8. Remove the lighthead.
9. Reinstall lighthead in the reverse order as outlined above. When making electrical connection at the lighthead, follow pictures for wire routing/folding outlined below.

8.5.1 BEFORE INSTALLING MONITOR SPRING ARM

1. Rotate monitor extension arm fully counterclockwise (as observed from the floor) until it rests against the stop. This minimizes tension on the cable coil inside the arm.

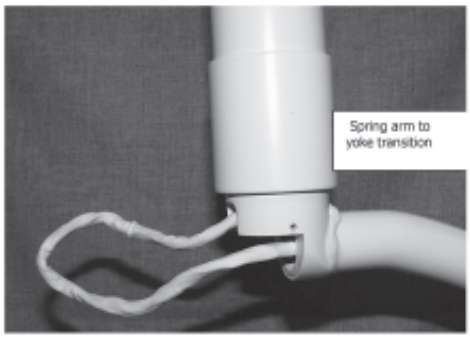


Figure 8-12. Gently Pull Wires from Lighthead.

Figure 8-13. Ensure Connections Are Secure

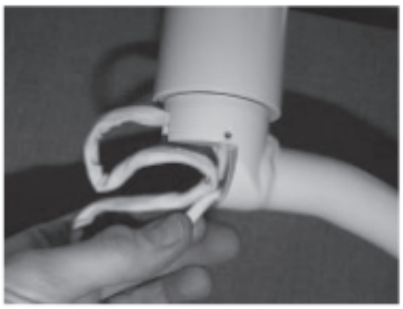


Figure 8-14. Fold Wiring into Loop

Figure 8-15. Tuck Looped Wires into Yoke Tube

Figure 8-16. Ensure Looped Wires are Dressed Away from any Moving Parts.

NOTE: DO NOT CUT CABLE TIE UNTIL SRPING ARM IS ROTATED INTO POSITION. Severe equipment damage will occur to wiring!

2. Ensuring that the monitor extension arm is rotated fully counterclockwise – cut the cable tie securing the cable bracket.
3. The monitor arm is locked at approximately 90° with a safety pin at the elbow. Do not remove safety pin until monitor is installed. See Figure 8-17.

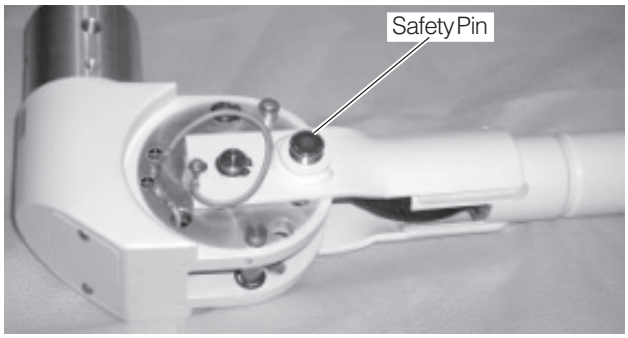


Figure 8-17. Monitor Spring Arm Safety Pin Location

8.6 REMOVAL OF THE CONTROL CENTER FRONT PANEL

1. Loosen but do not remove the screws on the top and bottom of the front panel, gently pull the front control center panel away.

Figure 8-18. Loosen Screws at Top of Control Center Cover

Figure 8-18. Remove Control Center Bottom Screws

2. Disconnect the ribbon cable of the panel. Note that pin one is oriented up and is marked with a notch or V on the connector/harness. Newer connections are keyed.
3. Reinstall in reverse order, make sure pin one is up, or touch pads will not operate properly. The wiring harness is fragile and easy to orient improperly and/or damage.

8.7 CONTROL CENTER PRECAUTIONS

1. The control center must not have wiring pinched between the rough in box and the back of the control (communication/video/lamp power)
2. The control center should not rest on the its back side, the connector boards can be damaged in the process.
3. The plastic control center cover is plastic and can easily be broken if dropped.
4. The 24 Volt dc power is active at all times, even when the lights are turned off. The only way to turn off DC power is at the rocker switch (line filter in rough-in box).

8.8 COMMUTATOR REPLACEMENT (MAIN SUSPENSION, NOT SPRING ARM)

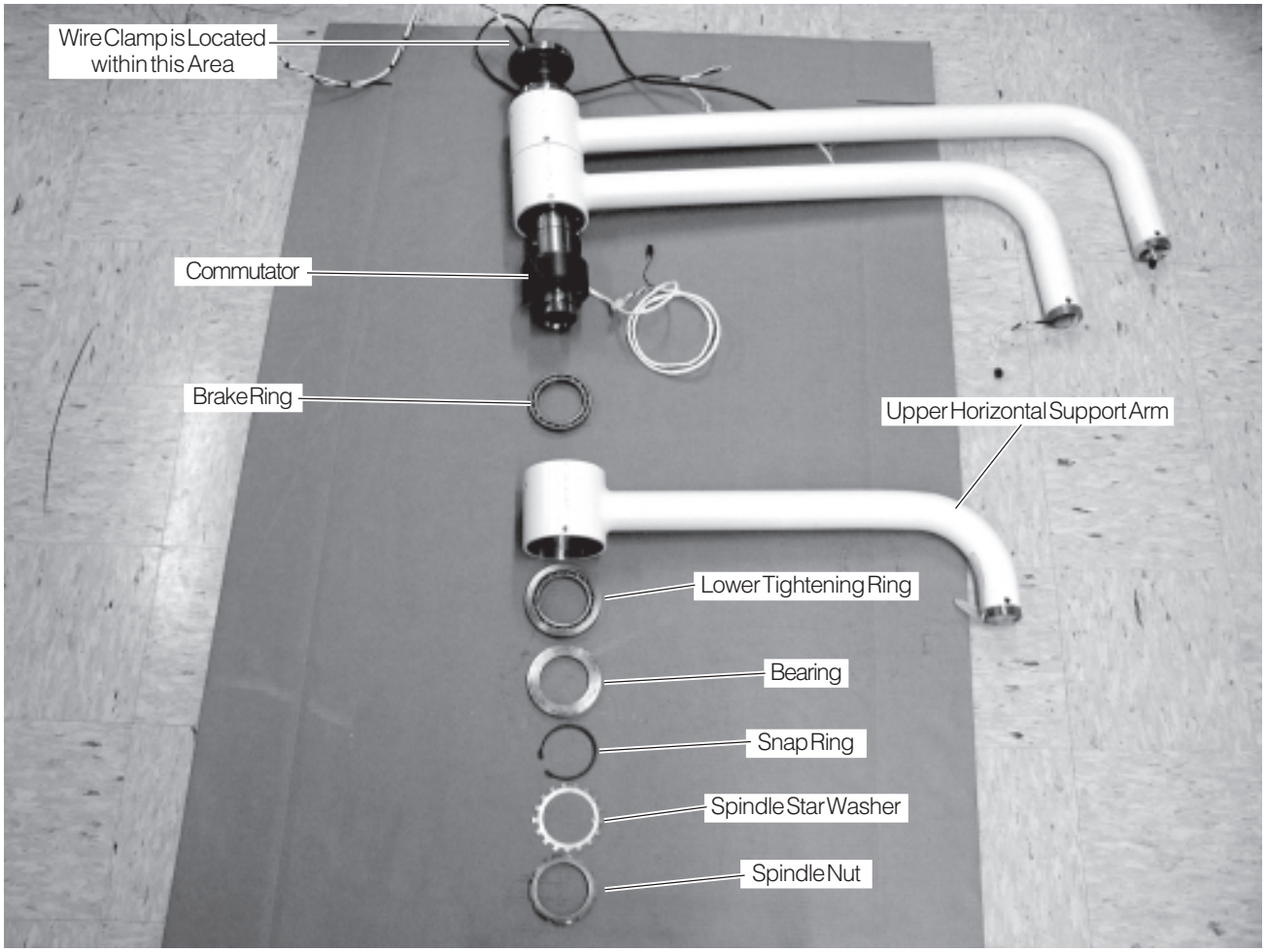


Figure 8-19. Commutator Componenets Arragned for Assembly

1. The commutator must be replaced with the electrical power off and the lighthead/spring arm removed. Follow the appropriate procedures for removing those components.

CAUTION: On early light systems, the wire clamp must be loosened to allow the wiring within the vertical tube to be free.

2. If the commutator is installed within an upper arm, then the lower arms beneath it and their light head/spring arms need to be removed first.
3. The arm(s) must be supported during the removal process, either by a genie lift or strapping the lower arms to the upper arms. Each arm is supported by a removable spring clip, with the lowest arm held on by a star washer and star nut; therefore, it is possible to remove the lowest arm by itself.
4. After all power is off and arms supported, the trim cap can be removed from the bottom of the suspension system. Remove the trim cap with the appropriate sized Allen wrench.
5. Remove the brake screws and locate the four set screws beneath securing the brake ring. Loosen all four set screws. Remove the lower star washer, star nut, and bearing from the main spindle. The bearing must be pulled out of the arm. There are two threaded holes in the bearing to assist in this procedure. Insert one 4 mm screw/bolt in each threaded bearing hole for removal of the bearing. Pull the bearing out.
6. Remove snap ring holding arm in place, use snap ring pliers P764330-502.

7. Remove pin holding commutator in and remove commutator.

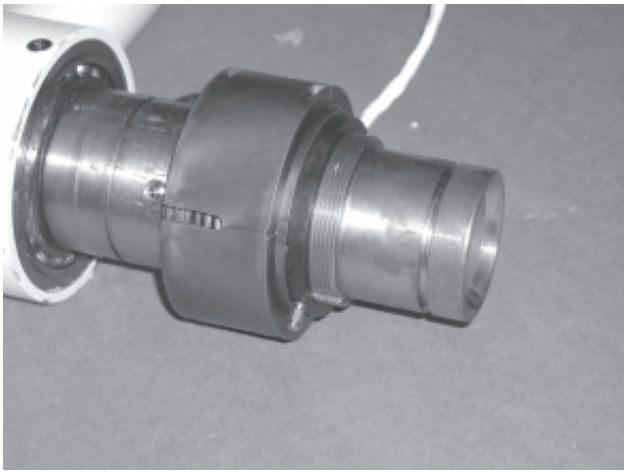


Figure 8-20. Commutator

8. Reinstall new commutator in reverse order as outlined above.

8.9 VOLTAGE ADJUSTMENT ON POWER SUPPLY

1. The power supply adjustment screw is located behind the cover of early model power supplies. The adjustment potentiometer is located between the 4 position terminal block TB2 and the connector header J2. On newer model power supplies there is an access hole drilled into the cover so that adjustment is possible without removing the cover.

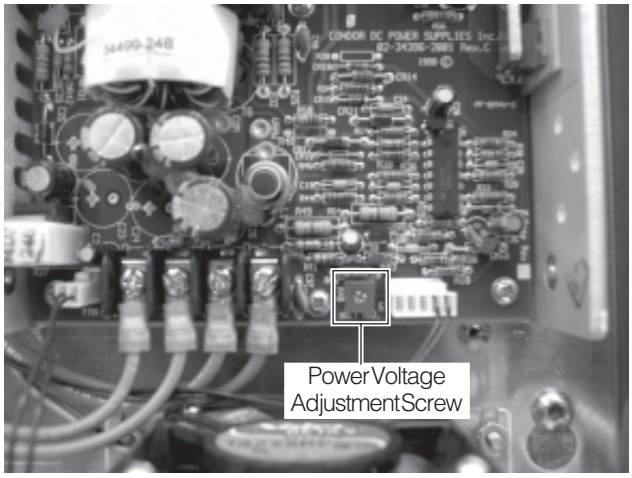


Figure 8-21. Voltage Adjustment Screw

2. Turn power ON and allow lights to remain off.
3. Adjust the potentiometer so that the DC output as measured at the rear of the power status board reads 24.5 VDC.
4. Reinstall all cover panels.

8.10 ELECTRICAL CONNECTOR REPAIR (SUSPENSION SYSTEM)

1. The pins/contacts used in the wiring harness of the Harmony LA system are very small, and very often cannot be successfully removed from their plugs; therefore, the entire connector must be removed and replaced if there is a problem with one wire.
2. With power OFF, cut off the entire plug where the problem wire has occured.
3. Obtain the appropriate test harness for the connector ends:

   DC Power Wiring 755717-301

   Communication/Video 755717-302
4. Cut off the appropriate connector end required for the repair. Allow a small amount of extra length for stripping/soldering.
5. Solder each wire in place, but first place a small length of heat shrink tubing over each wire.
6. Heat shrink tubing in place.
7. Turn ON electrical power, make connections, and test system.
8. Re-install all knuckle covers.

8.11 USING TEST HARNESS TO ISOLATE WIRING FAULTS

1. Test harnesses (all listed in special tools section) can be used to jumper out sections of light/monitor spring arms.
2. Remove knuckle/yoke covers of the arm to be tested. Disconnect existing connectors and install test harness.
3. Test operation of light/monitor after cycling power at main wall breaker.

Figure 8-22. Wiring Fault Test Harness

8.12 LENS CLIP REPLACEMENT PROCEDURES

1. Check lighthead for binding during lens rotation before turning on, if binding is present when lighthead is cold it could be in Gear Box, or oversized Lens Spacer.
2. Heat lighthead until lens binding occurs, approx. 45 minutes to 1 hour. Lighthead should be on through this whole procedure. Brake screws should be tightened at lighthead yoke to keep lighthead horizontal and prevent lighthead from tipping.
3. Remove cover and hood. Screws are captive. They must be loosened evenly and just a little bit at a time, otherwise the c-clip might fall into the base. After cover is removed, check to see that all seven c-clips are still in place.

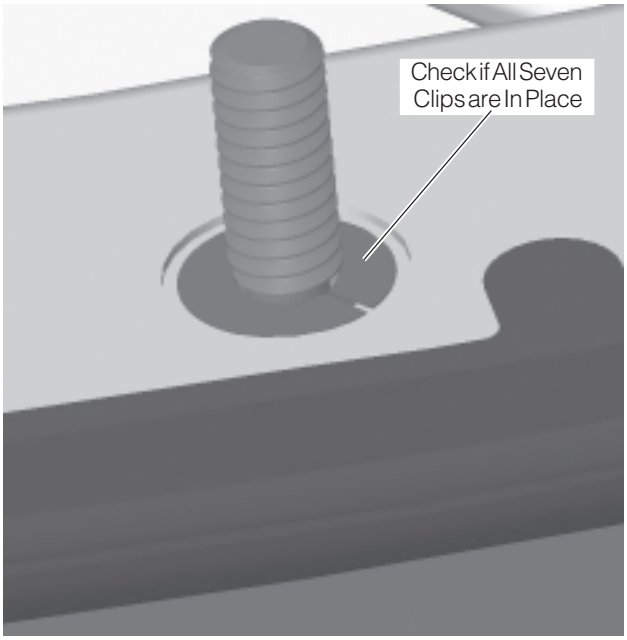


Figure 8-23. Check Clips

4. With lighthead on inspect each lens clip clearance between clip and lens to determine which clips are causing the binding.

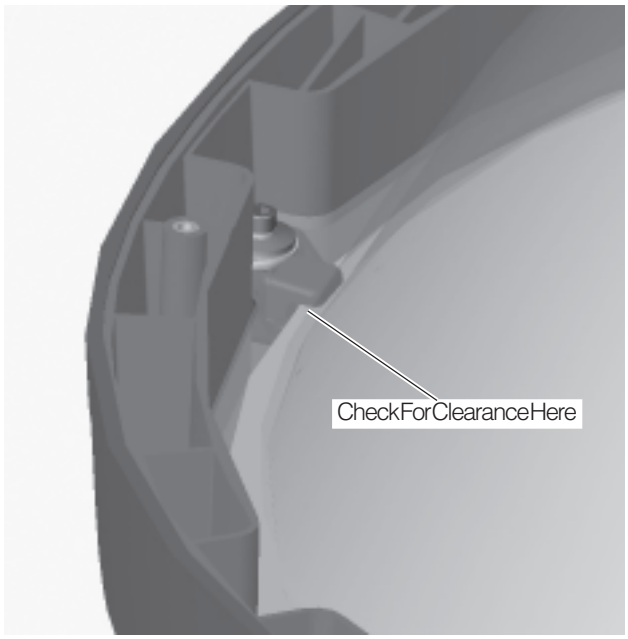


Figure 8-24. Check Lens Clips For Clearance

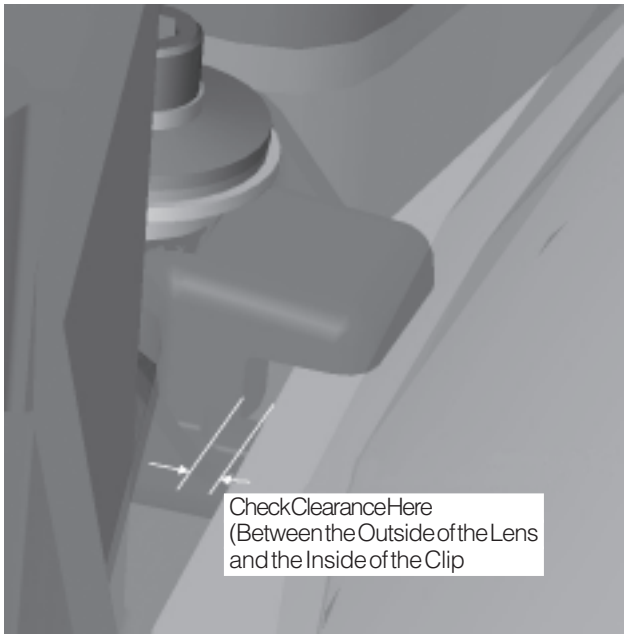
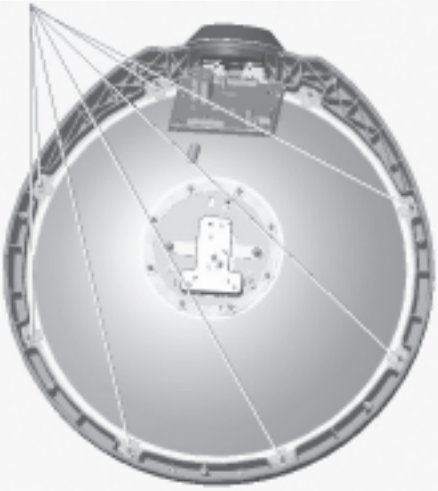


Figure 8-25. Lens Clip Clearance Detail View

5. With lighthead on loosen all eight lens clip screws. If binding still occurs, lens spacer may be causing binding.

NOTE: Loosen all eight screws and recenter the reflector assembly (see **Steps 3** and **4**).



NOTE: Keep the lighthead on, as the light shining through will help see the clearance through reflector.

Figure 8-26. Recenter Reflector

6. Using lighthead handle try to reposition lens assembly till you have visual clearance at all lens clip locations.

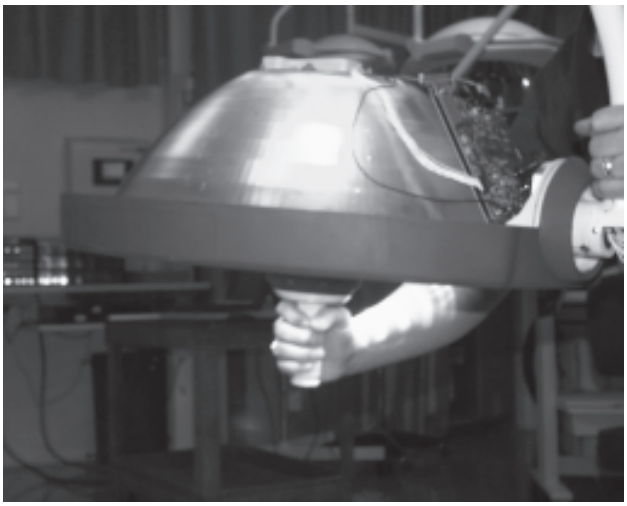
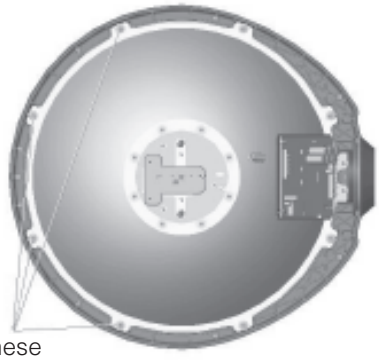


Figure 8-27. Reposition Lens Assembly Using Lighthandle

Figure 8-28. Rotate Lighthandle to Check for Binding

7. Retighten lens clip screws to proper torque. If there is significant clearance at all eight clips and no binding, reassemble cover. If there is minimum clearance or binding still occurs, then some clips must be replaced. Binding will likely occur at the two clips next to the yoke or two clips opposite the yoke.
8. Replace the 4 lens clips opposite yoke. Begin by removing all 8 lens clip screws. Replace 2 clips at a time. (4) Allen wrenches 3/32" or smaller with tee handles or thin screwdrivers are needed.



Remove These Four Clips

Figure 8-29. Lens Clips to Be Removed

9. Insert the Allen wrench or screwdriver through lens clip mounting holes into base holes next to the clips that need to be replaced. This is to prevent clips from falling out during the next step.

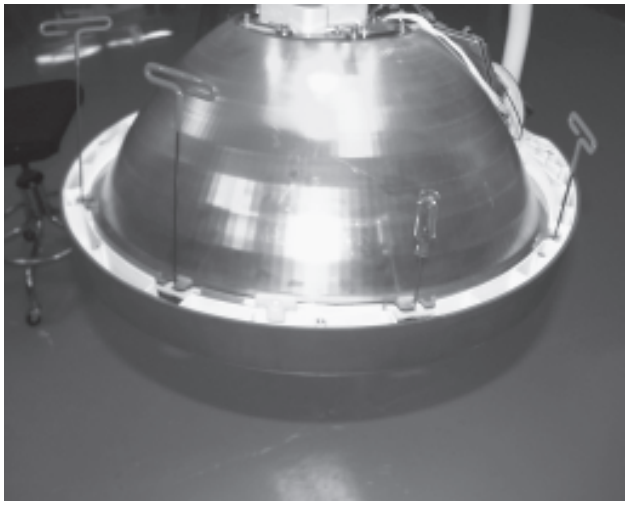


Figure 8-30. Check Lens Clip Alignment

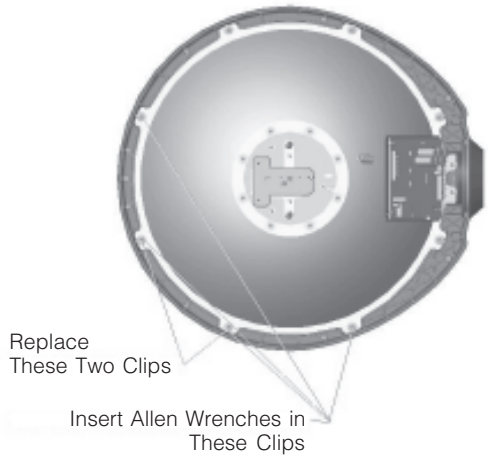


Figure 8-31. Insert Allen Wrenches into Lens Clips

10. From the bottom, lift up lens at clips until a spare clip can be wedged between base and lens. Place spare clip in between the clips that need to be replaced. The wrenches or screwdrivers will prevent the clips from falling out.

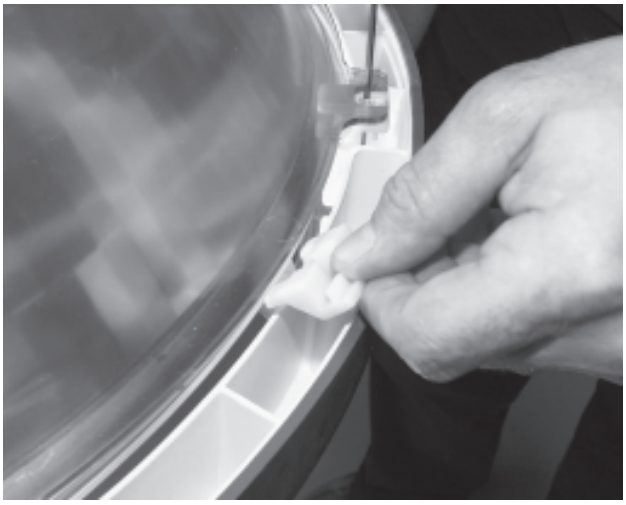


Figure 8-32. Lift Lens Using Spare Lens Clip

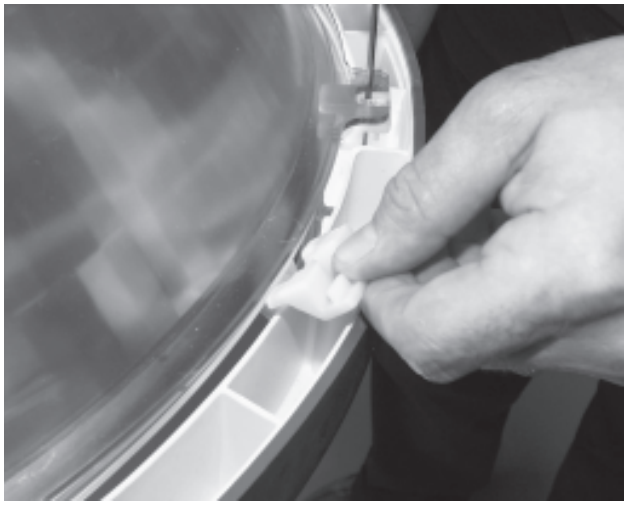


Figure 33. Insert Spare Lens Clip

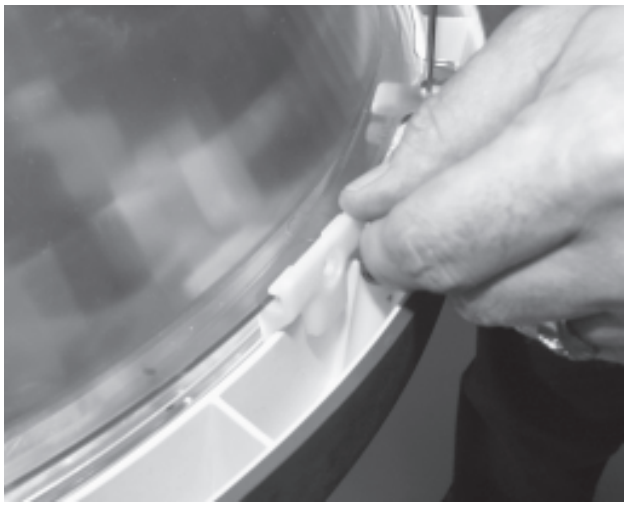


Figure 8-34. Lens Clip Removal

11. Pull wrench out of Clip to be replaced and push Clip out the bottom with wrench.

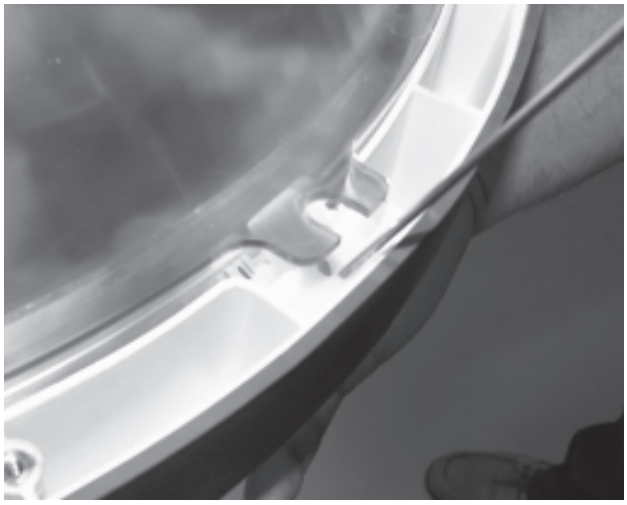


Figure 8-35. Remove Allen Wrench

12. Slide new clip up from bottom. Using wrench, guide clip between lenses to proper position, making sure upper lens is in the groove of the clip, then slide wrench through holes to hold clip in place. Repeat process at next clip.

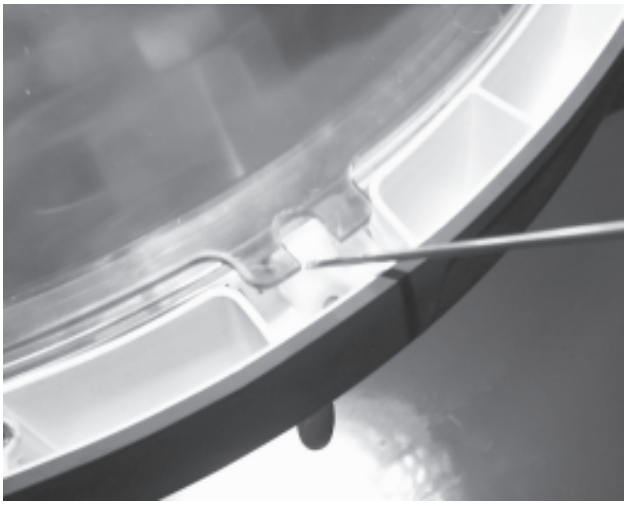


Figure 8-36. Slide in New Lens Clip

13. Slowly remove wedge clip from Step 10 while supporting lens assembly from bottom, moving Allen wrenches till clips fall into place
14. Repeat Step seven for other 2 clips.
15. Insert screws through clips, but do not tighten. Re-center lens assembly using lighthead handle until visual clearance is available at all lens clip locations.
16. Retighten lens clip screws to proper torque. Recheck clearance at all 8 clips and check for binding. If no binding, reassemble cover.

8.13 USE OF BRAKE RING CENTERING TOOL FOR HARMONY LA LIGHTS

Purpose: This procedure is intended to guide the service technician through the use of the Ondal Brake ring centering tool. This procedure is intended to limit the amount of non-concentricity seen on the Harmony LA central spindle Light Arm Brake Screws. This should minimize the brake screw wear, and the subsequent drifting of light arm. This procedure should be accomplished on only those main spindles that experience brake screws "backing out" or wearing prematurely. If the main spindle does not experience brake problems, do not attempt this procedure.

Tools Required (minimum):

Flashlight

Ladder,

Flat blade Screwdriver

Shop Rag

Centering Tool

1. Remove both brake screws, rotate the main spindle arm around and locate the four 3mm allen head screws that fix the position of the brake ring to the central spindle. The screws are visible through the brake screw holes, at 90 degree increments of arm rotation.
2. Loosen each of these screws approximately 1 ½ turns. Install the special tool in the brake screw hole according to figure 1. DO NOT attempt to pry the brake ring into place using the centering tool, it will severely bend the tool.
3. Rotate the arm slowly around the central axis with the tool in place. As you come approach one of the allen head screws, gently snug the allen screw down using the 3mm allen wrench, Do not tighten the screw fully yet.
4. Rotate the arm around the central spindle, approximately three turns, each time evenly tightening the allen head screws down during each rotation. Continue this until the screws are tight.
5. Reinstall the brake screws and adjust them with even clamping force. Tighten or loosen the brake screws evenly to set the correct arm tension.
6. Perform this procedure on other central axis arms as required.

8.14 INSTALLATION INSTRUCTIONS FOR HARMONY LA WEDGE LOCK SHIM KIT

The following instructions must be followed when installing the STERIS Harmony LA Ceiling Plate Assembly. This Wedge Lock Shim Kit is necessary when installing the wedge lock and vertical tube into the Harmony LA ceiling Plate assembly.

The shims included within this kit are intended to be installed, and take up the gap between the outside diameter of the vertical tube and the inside diameter of the wedge lock assembly. Three different shim thicknesses are included (.005", .010" and .015"). These shim choices are necessary, since the dimensions of the wedge lock components vary enough due to manufacturing tolerances, that one shim size alone may not be adequate.

Refer to the installation instructions for the Harmony LA Light for installation of the ceiling plate and wedge lock.

NOTE: A genie lift or similar device must be in place for any scenario that these shims are installed under (new installations or retrofits of this kit). The light system can possibly fall free of the ceiling plate if the safety ring is not installed and a genie lift is not supporting the weight of the system!

8.14.1 CHOOSING APPROPRIATE SHIM

1. The shim thickness is chosen before the vertical tube is installed into the wedge. This will occur just prior to *SECTION 4.2.2* in the Harmony LA Installation Instructions (129382-396).
2. Test fit the vertical tube into the wedge assembly. The suspension arms do not need to be in place for this step. Try to get a visual idea of the magnitude of the gap or play between the wedge and the vertical tube.
3. Choose a shim and slide it around the outside of the vertical tube. The shim should almost wrap around the entire vertical tube circumference (about 16"). Slide the vertical tube and shim together up inside the wedge. Again, visual inspect the gap to get an idea of how much gap is still there.
4. If it is possible to get a larger shim or possibly two shims in place, between the surfaces, then do so.
5. Install the vertical tube directly into the wedge, or follow the procedure outlined in *SECTION 4.2.2* of the installation instructions and assemble the vertical tube onto the suspension system first.
6. Lift the assembly into position . Take care that the shims do not slide up too far into the wedge, or they will cover up the holes that were drilled for the safety ring.
7. The correct method is to have approximately 1" of shim material sticking out, below the threaded portion of the wedge. This means that the shim is directly underneath the threaded portion of the wedge. This is where the shim(s) needs to be in order to be effective. See Figure 8-37:
8. Tighten the wedge locknut as specified in the installation instructions. If the Locknut slips or skips, then insert more shims as necessary to take up the gap further.

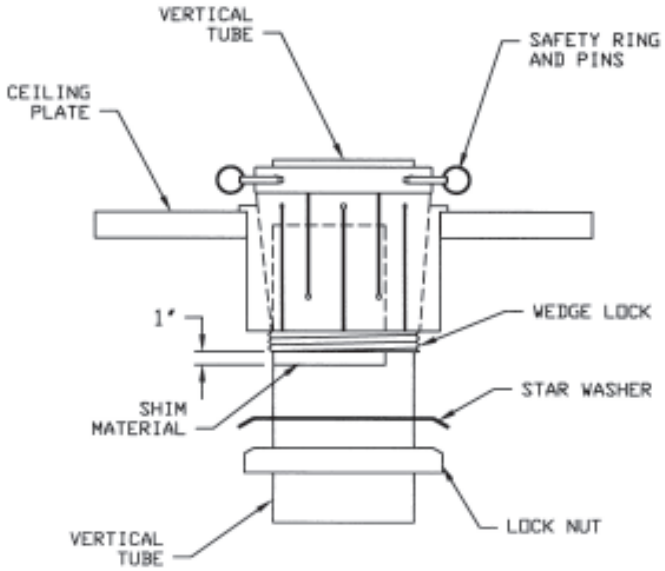


Figure 8-37. Wedge Lock Details

8.15 DISCOLORATION OF LIGHTHEADS

The back side of the light head can become discolored (brown tint). The problem is perceived to be heat related damage to the plastic light head shell, however, this is not the case.

If discoloration is noticed on the light head, it can be cleaned off using a rubbing alcohol solution. Rubbing alcohol is not to be used on the lenses of the light. The use of non STERIS cleaners can be a contributing factor to this problem. Always use cleaning solutions recommended in the Harmony LA operators manual. Coverage TB spray is not to be used to clean the back of the light heads.

8.16 USING JUMPER WIRES

8.16.1 USING JUMPER WIRES 755717-334, 755717-383

1. Take down or lower the canopy from the ceiling to gain access to the video connections in the ceiling (red-green-blue-black-white-yellow coaxial video cables).
2. Loosen the connection block at the back of the flat panel monitor to gain access to those connections as well.
3. Examine the video connections at both ends of the Harmony arm system to determine which wires are actually being used. It is possible that not all are being used. Typical colors used are red, green and blue.
4. If it is desired that all video wires are to be jumpered out at the same time, then Cable 755717-383 can be used. If only one wire at a time is to be tested, then 755717-334 can be used.
5. Hook-up the test harness (s) in place of the Harmony LA arm wiring. Turn on the customer's video source and monitor. Do not cross signals when hooking up the test cables.
6. If the monitor picture gets better, then the problem is most likely in the arm system wiring. If the picture stays the same then the internal arm cabling is most likely defective.
7. Use the paladin coaxial cable tester (phase I test kit 764331-738) to further isolate to a single failed cable.
8. If a single defective video cable is found, then it is possible that an unused cable can be substituted in its place, if the customer is not using all of the available signals. For example; if the green coaxial cable is identified as defective, then another color can be substituted in its place.

8.16.2 USING JUMPER WIRES 755717-352 AND 755717-353

1. These jumper wires are used typically after the 755717-334 and 755717-383 are used. The 755717-352 and 755717-353 are used to by-pass the 8-pin 22 gauge individual stranded wires that are installed inside the Harmony LA monitor arm wiring. They are <u>not</u> used to by-pass the video coaxial cable in the Harmony LA monitor arms.
2. Take down or lower the canopy from the ceiling to gain access to the 8-pin Harmony LA connector. It is an 8-pin black mini-connector with the following wire colors: red-white-orange-yellow-green-blue-brown-black.
3. Loosen the connection block at the back of the flat panel monitor to gain access to that connection end as well.
4. Connect jumper wires 755717-352 and 755717-353 in series. Disconnect the existing 8-pin connectors in both the ceiling and the yoke (monitor end) and replace them with the jumper wires. Turn on the customer's video source and monitors.
5. If the monitor picture gets better than before, then the problem is most likely in the arm system wiring. If the picture stays the same <u>and</u> all of the video signal coaxial cables have been previously tested, then the problem exists someplace other than the Harmony LA monitor arm wiring.
6. If the Harmony LA wiring is found faulty, then it cannot be replaced. However, it is very possible that all eight colors are not used by the customer. If this is the case, identify one or more colors that are not being used.
7. Cut off the 8-pin connectors at both the monitor end and the ceiling end.
8. Using heat shrink tubing, re-solder all the wires that are not defective back onto the 8-pin connector, but using a color that is known to be good using a continuity check.
9. For example; if the orange wire is used by the customer and is determined to be bad, then choosing another color and soldering it in place of the orange wire will save the suspension system from being replaced.

10. Whatever change is made at one end of the cable must be made at the other end of the cable as well.
11. If desired, the test harness connector end may be cut off and used as the replacement end for repairing the Harmony LA arm wiring.

8.16.3 USING JUMPER WIRE 755717-302 FOR TROUBLESHOOTING HARMONY LA CAMERA SYSTEM

The following procedure eliminates the suspension system and light heads as a cause of the problem.

1. The jumper wire 755717-302 can be used to assist in the troubleshooting of camera systems problems.
2. In particular, the red and orange wires carry the luminance and synchronization signals (Y- or Y+). The yellow and green wires carry the color (C+, C-) signals.
3. If the entire camera picture is either gone or jumps around uncontrollably, then most likely the Y- or Y+ signal wires are either cut or shorted. If the camera only displays in black and white, then the color signal C+ or C- is either cut or shorted.
4. Begin by swapping the camera between available light heads. If the picture stays the same, then most likely the problem does not exist within the Harmony LA suspension system. If the picture gets better, then a problem most likely exists within the problematic light head or spring arm or main spindle assembly.
5. Use the jumper wire to jumper out the spring arm wiring (see figure below). If the picture improves, the problem exists somewhere within the Harmony LA spring arm and its commutators.
6. If the picture does not improve, then the problem is possibly in the main suspension system. The four color wires listed above can be ohmed out or continuity tested within the main spindle to determine if a problem exists within the main spindle.
7. The main spindle commutator wiring is replaceable (see other sections within the Harmony LA service manual to replace the commutator).
8. To determine if the problem exists within the light head, the light heads can be switched between spring arms by physically moving them between spring arms. The light heads can also be placed in very close proximity to each other, and the connectors from one spring arm can be fed into the opposite light head and vice-versa. This is used as a last resort in the suspension system testing.
9. If the problem transfers with the transfer/or switching of the light head, only then the problem is most likely inside the light head wiring. Either the connectors internal to the light head need to be replaced or the light head circuit board is somehow defective.

Section 9: Harmony LA Exploded Views and Parts Lists

Assemblies and components of Harmony LA Surgical Lighting and Visualization System are illustrated and identified on the following pages. The part number, the description and the quantity required for each usage are given. Each indentation in the description represents the assembly level. The UNITS PER ASSEMBLY column is specific for the given assembly or subassembly level.

NOTE: *This maintenance manual does not include the DeepSite Fiber Optic Light or the Flat Panel Mount. Refer to Maintenance Manual P-764330 210 for DeepSite.*

NOTE: *If not listed, no other components for this assembly are available. If other components are needed order upper level noted.*

How to Use the Illustrated Parts Breakdown

(1) Determine the function and application of the part required. Turn to the list of illustrations and select the most appropriate title. Note the illustration page number.

(2) Turn to the page indicated and locate the desired part on the illustration.

(3) From the illustration, obtain the index number assigned to the part desired. Refer to the accompanying description for specific information regarding the part.

(4) Many arm systems have the third-party part number listed first, followed by the letter D. For example 1855339D. The combination of the two makes it the STERIS part number.

⚠ CAUTION: To prevent voiding the warranty or damaging the equipment, use only STERIS replacement parts.

Typical Indentation Example

One indentation – first subassembly, part of assembly under which it is indented

No indentation – part of top assembly

	P	146655	023		ARM AND LIGHTHEAD ASSEMBLY .....
1	P	136807	181		CAP .....
2	P	136807	981		FUNNEL CONE ASSEMBLY .....
	P	136807	979		• CAP, Shield .....
	P	129362	378		• CLIP, Locking .....
	P	93911	304		• CONE, Cap .....
	P	136807	980		• FUNNEL, Cap .....
3	P	83628	001		SCREW, Button Head, #6-32 x 3/8 Lg. ..
4	P	19684	061		LOCKWASHER, Helical, #6 .....
5	P	90713	061		LOCKWASHER, Helical, #4 .....
6	P	47760	091		SCREW, Button Head, #4-40 x 1/4 Lg. ..
7	R	2630	250		CABLE, 6 Lg. .....
8	P	129362	216		RING, Terminal, #6 .....
9	P	129362	353		RETAINER, Split Ring .....

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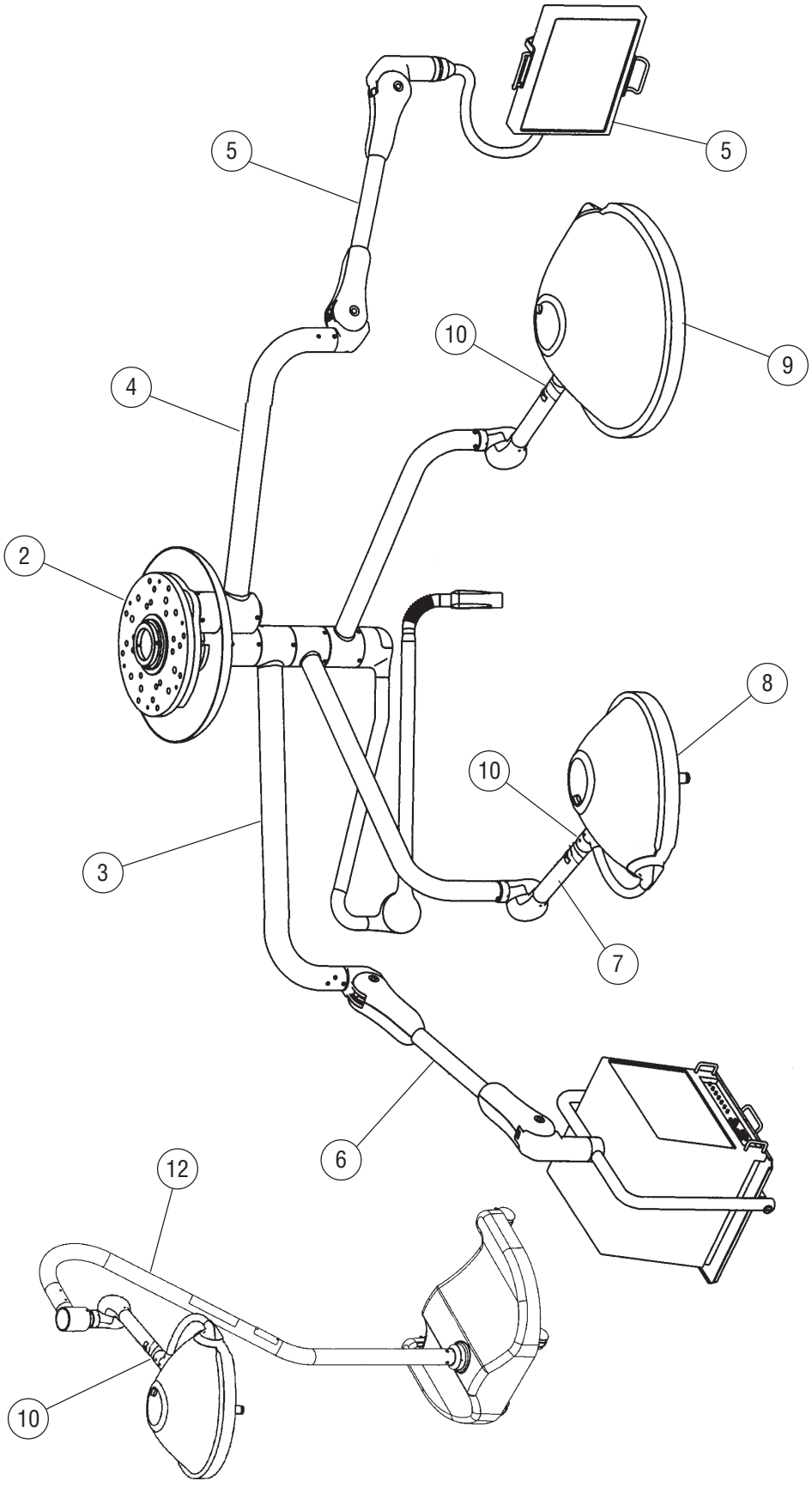


Figure 9-1A. Harmony LA Surgical Light And Visualization Assembly, Complete

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-1A- 1					HARMONY LA SURGICAL LIGHT AND VISUALIZATION ASSEMBLY, COMPLETE	X			
2		18553	33D		CEILING PLATE ASSEMBLY (See Figure 9-2)				
3		18553	34D		SPINDLE, Dual Central, 44" & 36" Arms (See Figure 9-3A)				
		18553	35D		SPINDLE, Dual Central, 49" Monitor Arm & 36" Light Arm (See Figure 9-3A)				
		18553	36D		SPINDLE, Dual Central, 44" Light Arm w/Spacer Only (See Figure 9-3A)				
		18553	37D		SPINDLE, Triple Central, 44" & 36" Light Arms				
		18553	38D		SPINDLE, Triple Central, 44", 36" & Spacer Only (See Figure 9-3C)				
		18553	39D		SPINDLE, Triple Central, 49" Monitor Arm & 36" Light Arm (See Figure 9-3B)				
		18553	40D		SPINDLE, Triple Central, 49" Monitor Arm & 44" Light Arm, Spacer Only (See Figure 9-3C)				
		18747	10D		SPINDLE DUAL CENTER MONITOR Arm w/Hub Spacer				
		18553	45D		SPRINGARM & YOKE (FPM) (See Figure 9-5A)				
		18548	28D		SPRINGARM & YOKE (CRT) (See Figure 9-5B)				
4		18553	50D		SPINDLE, Auxiliary, w/Mounting Plate, Extension Tubes (See Figure 9-4)				
5		18553	45D		SPRING ARM/YOKE ASSEMBLY (FPM) (See Figure 9-5A)				
6		18548	28D		SPRING ARM/YOKE ASSEMBLY (CRT) (See Figure 9-5B)				
7		18548	27D		SPRING ARM/YOKE ASSEMBLY (See Figure 9-7)				
8	B	129382	391		HARMONY LA 500 LIGHTHEAD (See Figure 9-8A)		X		
	P	136820	001		• STERILE HANDLE (Not Shown)	2			
	P	093926	001		• HANDLE, Aluminum (Not Shown)	2			
	P	093926	047		• LAMP, Halogen (Not Shown)	2			
	P	129382	395		• UNCRATING INSTRUCTION (Not Shown)	1			
	P	129382	396		• INSTALLATION INSTRUCTION (Not Shown)	1			
9	B	129382	393		HARMONY LA 700 LIGHTHEAD (See Figure 9-8B)			X	
10	P	136820	281		LABEL, Lighthead Number (Not Shown)	1	1	1	
11	P	146667	035		ASSEMBLY, Harmony Wall Control, (Not Shown) (See Figure 9-9)				
12	P	146667	210		MOBILE LIGHT STAND, 500 Lighthead (See Figure 9-16)	1			
13	P	146667	182		KIT, LA 500/700 Light Packing	1	1	1	
14	P	146667	186		KIT, LA Control Packing		1	1	
15	P	093926	286		KIT, Ceiling Plate Packing		1	1	
16	P	093926	285		KIT, Suspension System Arm Packing	1	1	1	
17	P	093926	282		ARM, Spring (One each for lighthead spring arm & flat panel spring arm)	1			
18	R	001801	141		PAINT, Touch-Up, 40 cc. Bottle	A/R			
19	P	764331	890		PAINT, Spray Can	A/R			
20	P	129382	106		OPERATOR MANUAL, Harmony (Not Shown)	1	1	1	

NOTE: *Tandem mount surgical light mounting structure, is covered in EMS manuals.*

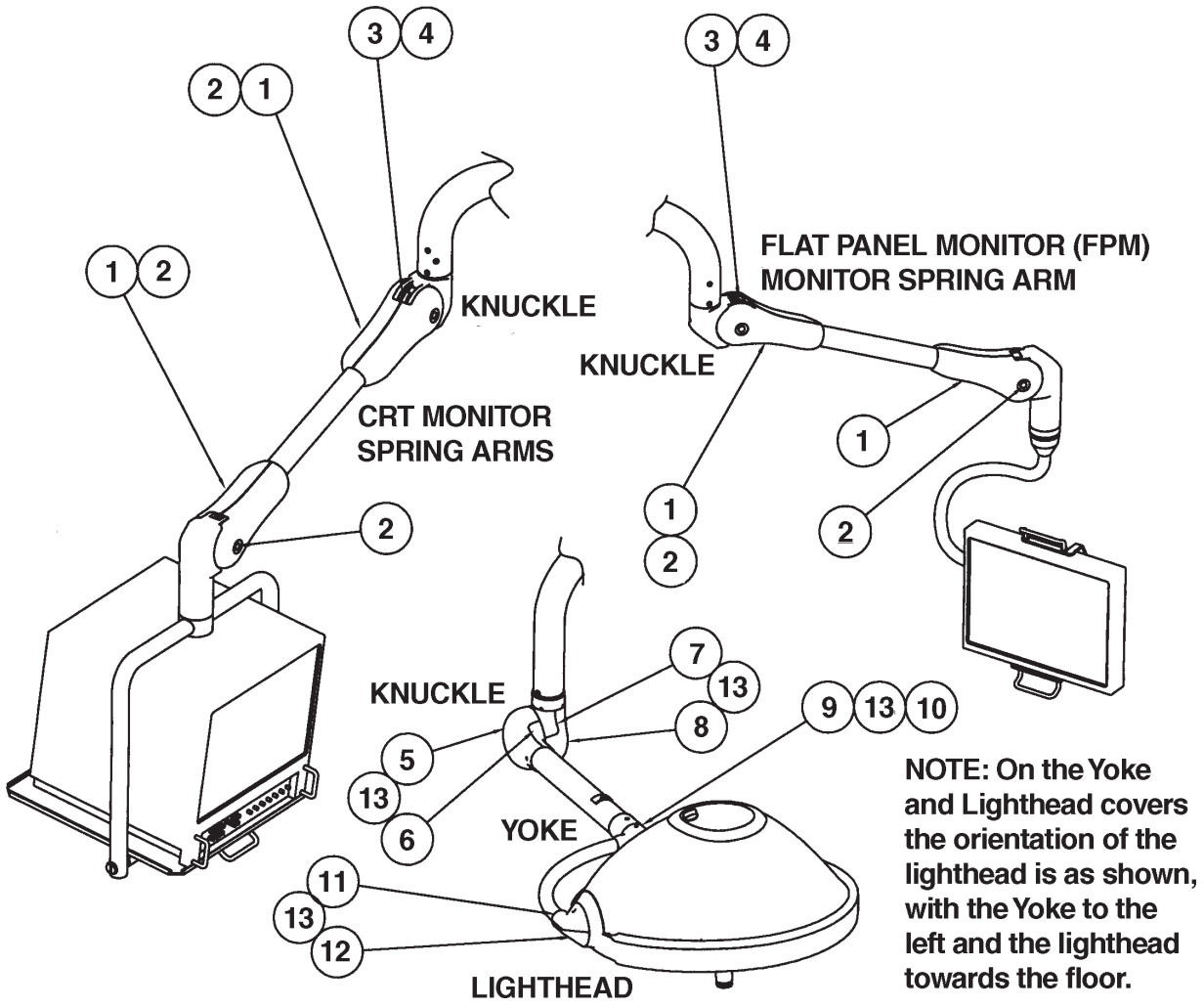


Figure 9-1B. Harmony LA Surgical Light And Visualization System Covers

FIG. & INDEX NO.	PART NUMBER		SVC	DESCRIPTION	UNITS PER ASSEMBLY
9-1B-				HARMONY LA SURGICAL LIGHT AND VISUALIZATION SYSTEM COVERS	X
1	015068	13D		COVER, Monitor Spring Arm	4
2	000375	91D		SCREW, M4 x 6	2
3	000373	87D		GUARD, SS, Knuckle Cover	4
4	000167	94D		SCREW, M3 x 6	4
5	015067	70D		COVER, Knuckle Lower Outside	1
6	015067	71D		COVER, Knuckle Lower Inside	1
7	015067	69D		COVER, Knuckle Upper Inside	1
8	015067	68D		COVER, Knuckle Upper Outside	1
9	015068	08D		COVER, Yoke Bottom	1
10	015068	09D		COVER, Yoke Top	1
11	015068	11D		COVER, Lighthead Bottom	1
12	015068	10D		COVER, Lighthead Top	1
13	000169	95D		SCREW, M3 x 8	4

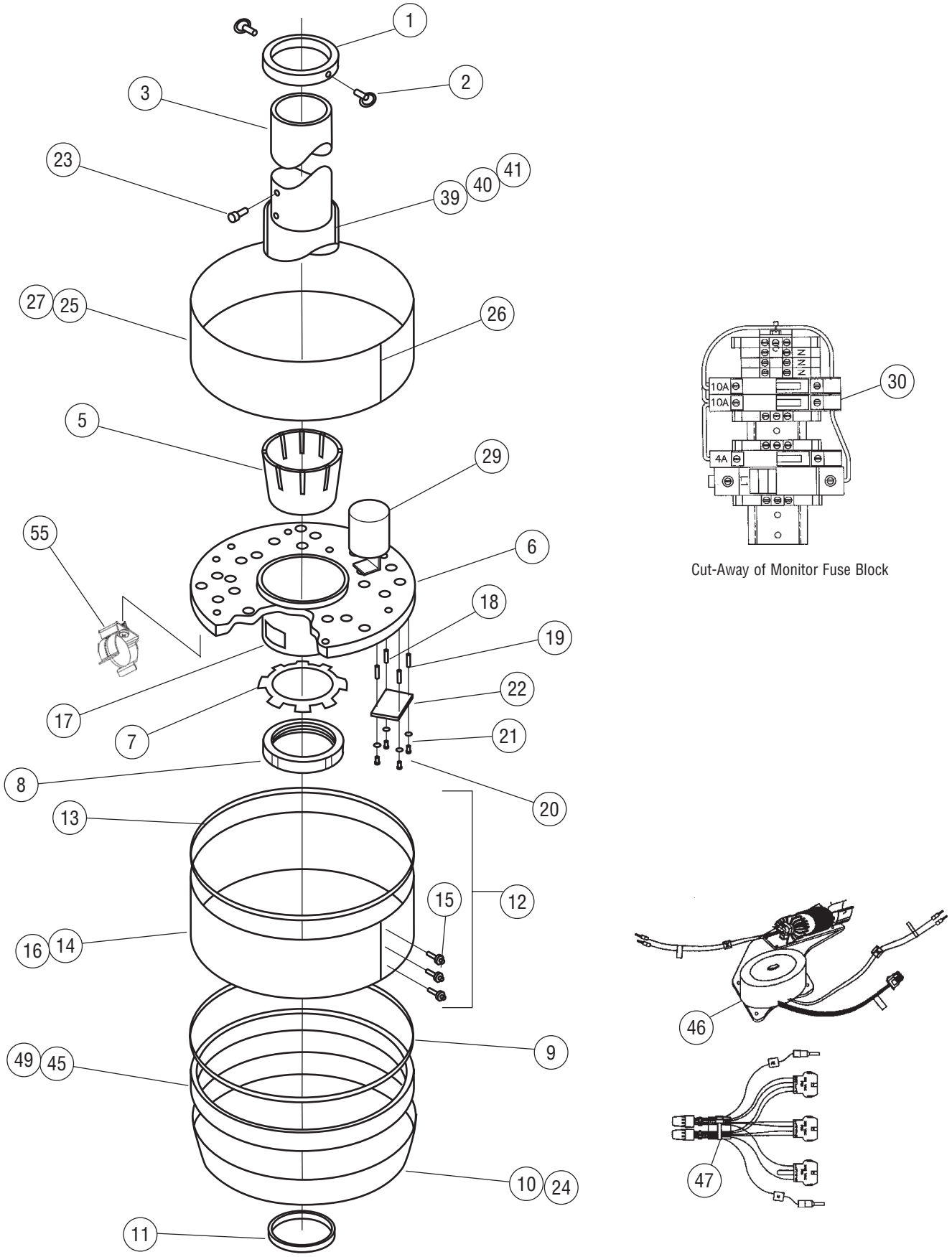


Figure 9-2. Harmony LA Ceiling Plate Assembly

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY					
9-2-		18553	33D		HARMONY LA CEILING PLATE ASSEMBLY	X					
1		000802	16D		SAFETY RING	1					
2		015113	57D		PIN, Push	4					
3		015067	31D		VERTICAL TUBE	1					
4					No Used						
5		015088	06D		WEDGE LOCK	1					
6		015067	38D		ASSEMBLY, Ceiling Plate	1					
7		015070	51D		STAR WASHER	1					
8		015067	56D		NUT	1					
9		015129	32D		GASKET, Canopy	1					
10		015067	36D		CANOPY	1					
11		015076	90D		CANOPY COLLAR	1					
12	P	146667	060		CANOPY EXTENSION KIT, 6"		X				
	P	146667	317		CANOPY EXTENSION KIT, 6" To 12"			X			
13	P	093926	198		• TRIM, Push-on		1	1			
14	P	136820	037		• SHEET, White Delrin		1	–			
15	P	129382	243		• RIVET, Bulb Type Blind		3	4			
16	P	136820	225		• SHEET, White Delrin, 12"		–	1			
17					LABEL, Data (Reference Only)						
18	P	129382	329	*	STANDOFF, M3 x .5 x 6 mm	4					
19	P	129382	330	*	STANDOFF, M3 x .5 x 31 mm	4					
20	P	129382	331	*	SCREW, M3 x 6 mm	4					
21	P	129382	332	*	WASHER, Lock, Ext Tooth, M3	4					
22	P	136820	105	*	HUB INTERFACE BOARD	1					
23		015104	77D		SCREW, Vertical Tube, M6 x 12	8					
24		000351	19D		SCREW, Canopy	5					
25	P	093926	354		KIT, Hub Enclosure				X		
26	P	129382	560		• RIVET, Plastic Push-In				3		
27	P	093926	352		• ENCLOSURE, HUB Assembly				1		
28	P	129382	444		• TIE, Cable, .190 W x 14.5 Lg. (Not Shown)				2		
29	P	093926	208		KIT, Monitor Fuse Block					X	
30	P	146667	058		• ASSEMBLY, Fuse Block					1	
31	P	150824	722		• SCREW, M3 x 6 mm Lg. (Not Shown)					2	
32	P	129382	332		• WASHER, Lock, M3 (Not Shown)					4	
33	P	129382	428		• SCREW, M3 x 10 mm Lg. (Not Shown)					2	
34	P	093926	249		• PLATE, Mounting (Not Shown)					1	
35	P	129382	415		• STANDOFF, M3 x 40 mm Lg. (Not Shown)					2	
36	P	129382	311		• FUSE, 10A (Not Shown)					2	
37	P	129382	310		• FUSE 4A (Not Shown)					1	
38	P	129382	309		• FUSE 20A ATMR (Not Shown)					1	
39	P	129382	626		KIT, Shim (For S/N before 0110112403020)	X					
40	P	129382	628		• SHIM, .005 (Not Shown)	1					
41	P	129382	629		• SHIM, .010 (Not Shown)	1					
42	P	129382	630		• SHIM, .015 (Not Shown)	1					
43	P	129382	519		PLATE, EEP Adapter Ceiling (Not Shown)	A/R					
44	P	762650	725		TEMPLATE, Ceiling (Not Shown)	A/R					
45	P	136820	308		KIT, Ambient						X
46	P	705717	480		• SUBASSEMBLY, Transformer Plate, RB1100						1
47	P	755717	481		• HARNESS, Ambient Light Transformer						1
48	P	129382	415		• STANDOFF, M3 x .5 x 41 mm Lg. (Not Shown)						1
49	P	755717	479		• SUBASSEMBLY, Light Housing Panel						1
50	P	129382	564		• INSTRUCTIONS, Installation, STERIS (Not Shown)						1
51	P	129382	106		• MANUAL, STERIS Harmony Operator (Not Shown)						1
52					• SCREW, Socket Head Cap, M3 x 10 mm Lg. (Not Shown)					4	
53					• WASHER, Spring, M3 (Not Shown)						4
54					• WASHER, Flat, M3 (Not Shown)						4
55	P	129382	743		KIT, Ambient Green Filter Lens						A/R
56	P	764332	068	**	• KIT, Hardware (Not Shown)	1					
					**Parts come with standard control center.*						
					*** Hardware for the ceiling is only available in this kit.*						

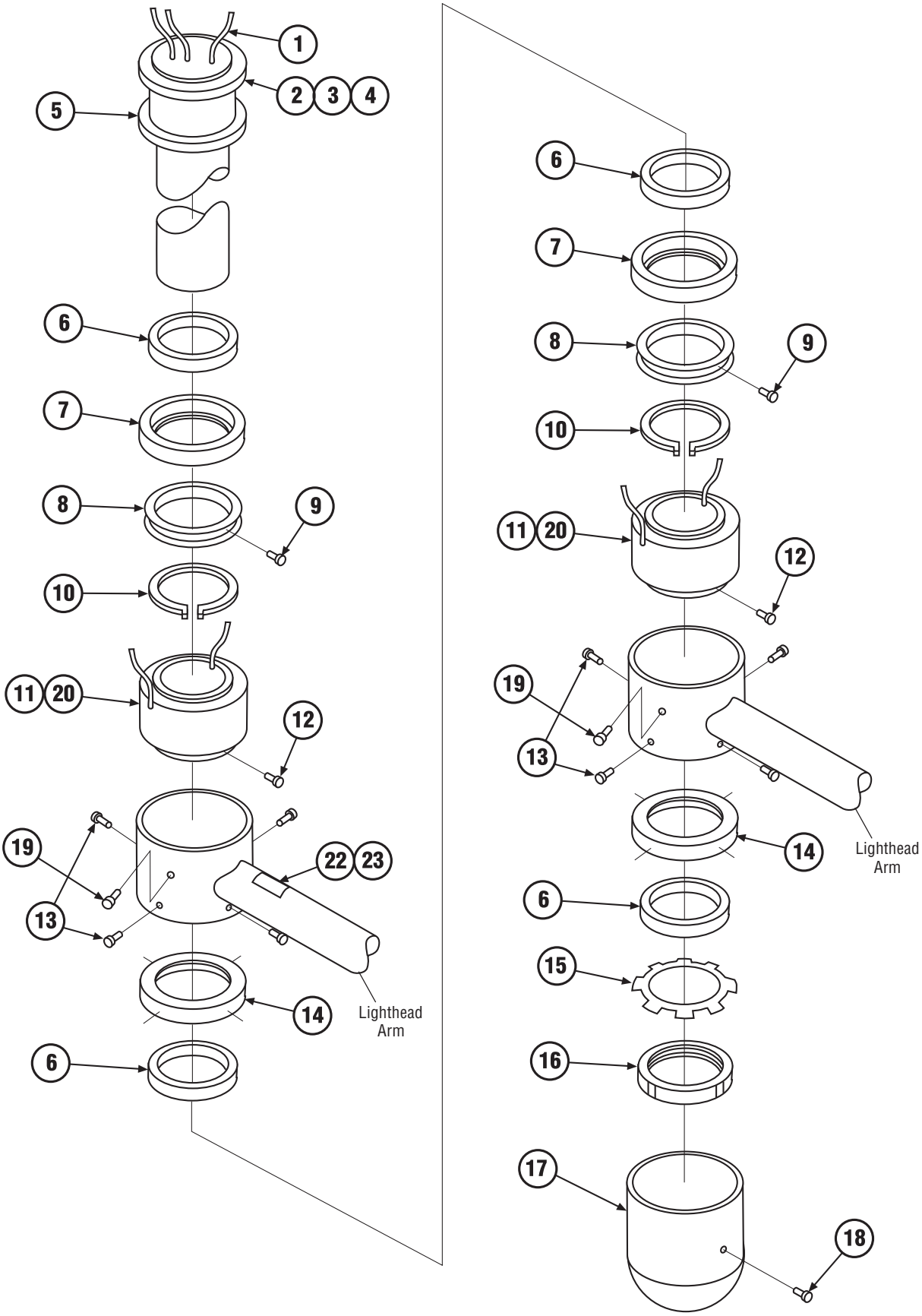


Figure 9-3A. Harmony LA Extension Arms - Dual Spindle

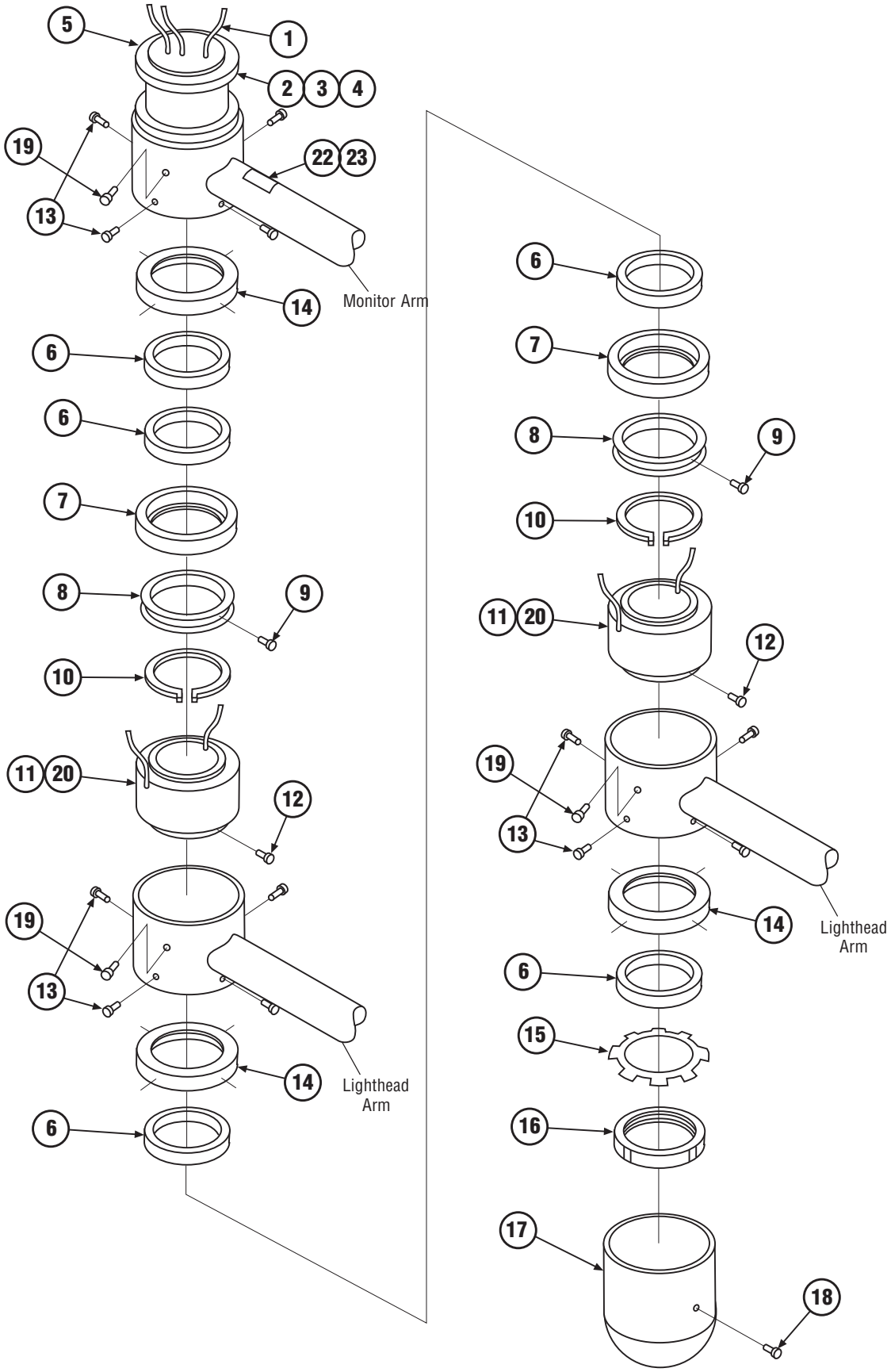


Figure 9-3B. Harmony LA Extension Arms - Triple Spindle

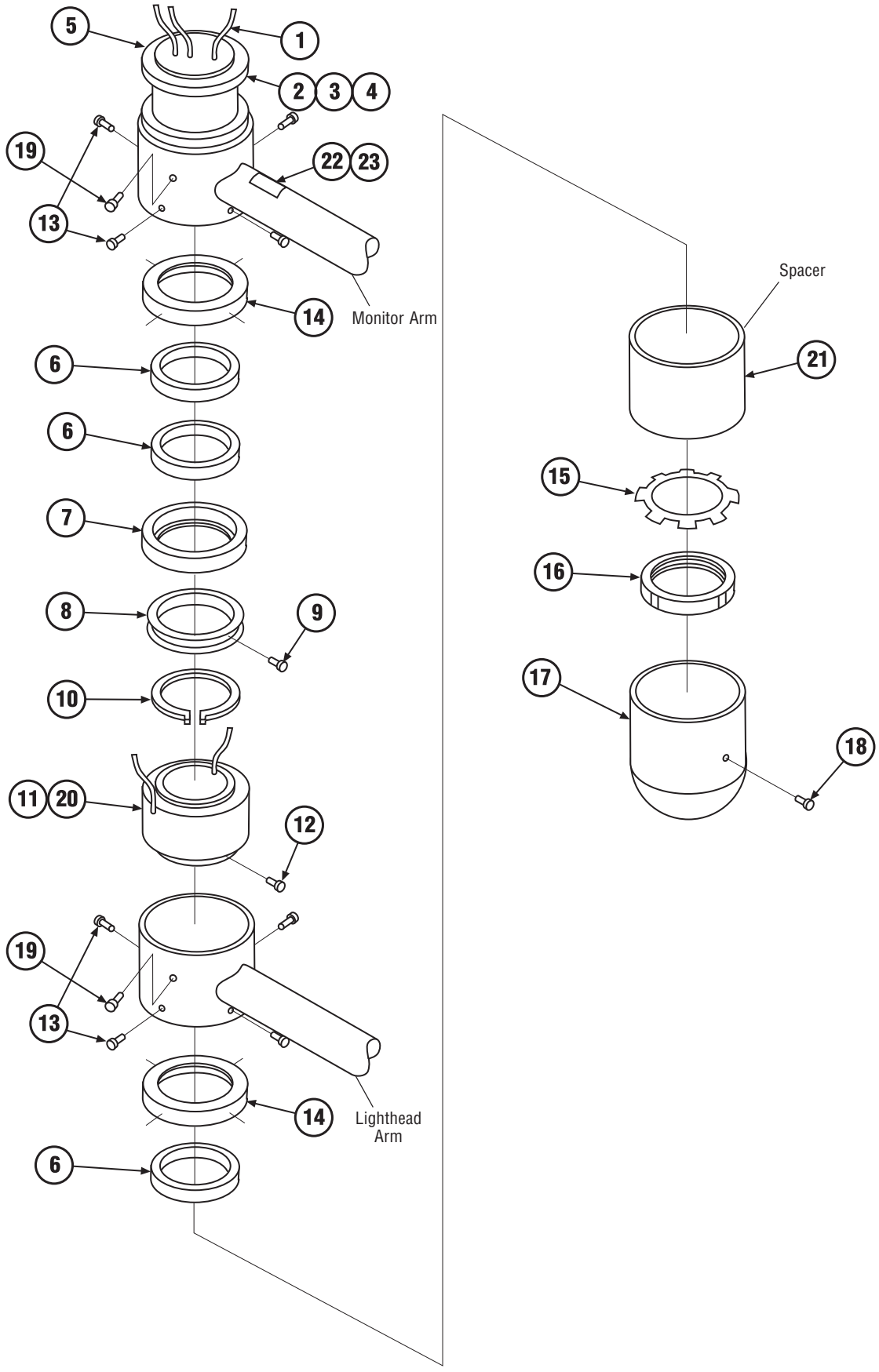


Figure 9-3C. Harmony LA Extension Arms - Triple Spindle With Spacer

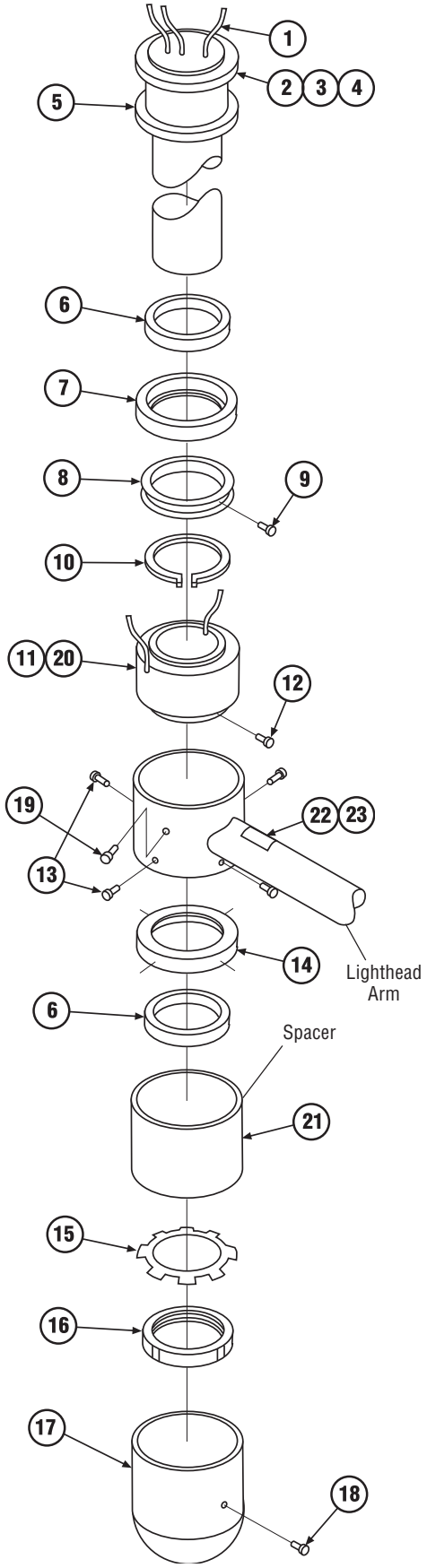


Figure 9-3D. Harmony LA Extension Arms - Dual Spindle With Spacer

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-3-	18553 34D	*	SPINDLE, DUAL, 44" LIGHT + 36" LIGHT	X			
	18553 39D	*	SPINDLE, TRIPLE, 49" MONITOR + 44" LIGHT + 36" LIGHT		X		
	18553 40D	*	SPINDLE, TRIPLE, 49" MONITOR + 44" LIGHT + SPACER			X	
	18553 36D	*	SPINDLE, DUAL, 44" LIGHT + SPACER				X
	18553 35D	*	SPINDLE, DUAL CENTRA, 49" MONITOR + 36" ARM	X			
	18553 37D	*	SPINDLE, TRIPLE CENTRA, 44" MONITOR + 44" LIGHT + 36" LIGHT ARM		X		
	18553 38D	*	SPINDLE, TRIPLE CENTRA, 44" & 36" LIGHT ARM W/SPACER			X	
1	015076 29D		WIRE, Ground	1	1	1	1
2	000197 60D		SCREW, M4 x 8	1	1	1	1
3	000110 53D		WASHER, A4, 3	1	1	1	1
4	000357 34D		LABEL, Ground	1	1	1	1
5			SPINDLE, Central (Reference Only)	1	1	1	1
6	015067 52D		BEARING, Upper/Lower	4	6	4	2
7	015067 34D		RING, Tightening (Upper)	2	3	2	1
8	015067 43D		BRAKE RING	2	2	1	1
9	015030 18D		SCREW, M4 x 14	8	12	8	4
10	015067 53D		SNAP RING, DIN 471 - A80	2	5	4	2
11	015067 39D		COMMUTATOR, Main	2	2	1	1
12	015076 39D		PIN, Commutator	2	2	1	1
13	000634 21D		SCREW, M6 x 12	8	12	8	4
14	015071 51D		RING, Tightening (Lower)	2	3	2	1
15	015076 02D		STAR WASHER, Spindle	1	1	1	1
16	015067 54D		NUT, Spindle	1	1	1	1
17	015088 72D		COVER, Spindle	1	1	1	1
18	015045 76D		SCREW, M6 x 35	1	1	1	1
19	000358 99D		SCREW, Brake - Spindle	2	3	3	1
20	000667 36D		SCREW, Commutator, M5 x 20	3	3	3	3
21	015076 40D		SPACER, Hub	–	–	1	1
22			SERIAL NUMBER TAG (Reference Only)	1	1	1	1
23			OVERLAY, Clear Serial Number Tag	1	1	1	1
24		*	ARM, Monitor, (Not Shown)	–	1	1	X

** 4 configurations of spindles are shown in Figures 9-A, B, C, D. Choose the configuration that best represents your configuration.*

NOTE: *If there are no components noted, order upper level assembly.*

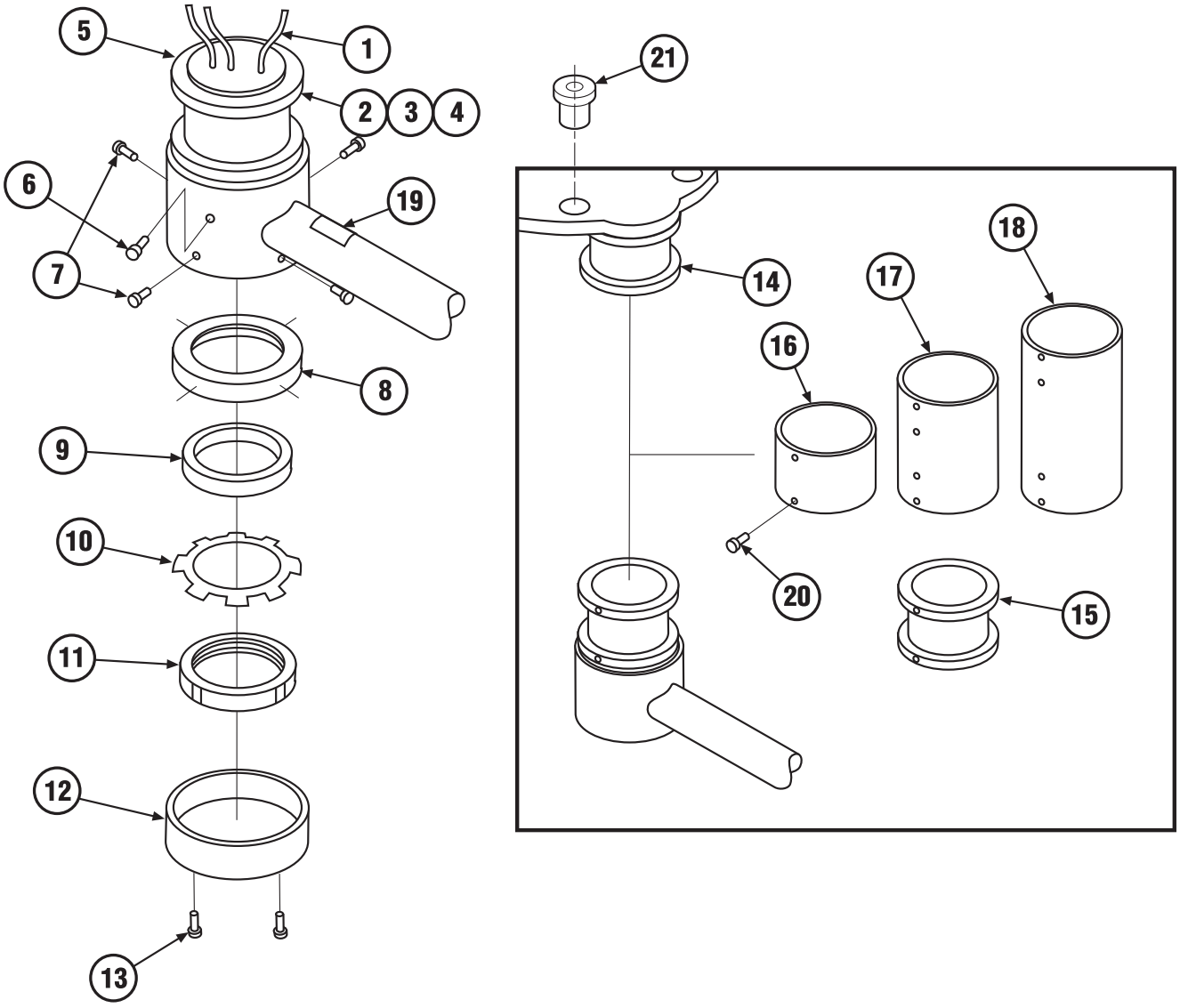


Figure 9-4. Harmony LA Extension Arm For Flat Panel Or CRT Monitor

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
9-4-	18553 50D		HARMONY LA 44" EXTENSION ARM (FOR FPM OR CRT MONITOR)	X
1	015076 29D		WIRE, Ground, 1 x AWG	1
2	000197 60D		SCREW, M4 x 8	1
3	000110 53D		WASHER, A4, 3	1
4	000357 34D		LABEL, Ground	1
5			WELDMENT, Spindle (Reference Only)	1
6	000358 99D		SCREW, Brake - Spindle	2
7	000634 21D		SCREW, M6 x 12	4
8	015071 51D		RING, Tightening Lower	1
9	015067 52D		BEARING, Ball	2
10	015076 02D		WASHER, Star	1
11	015067 54D		NUT	1
12	015088 72D		COVER	1
13	000170 47D		SCREW, M4 x 10	2
14	015106 18D		WELDMENT, Adapter Plate	1
15	015102 98D		TUBE, Adapter	1
16	015106 49D		TUBE, Vertical Extension (16-1/4" Lg.)	1
17	015106 48D		TUBE, Vertical Extension (20-1/4" Lg.)	1
18	015106 47D		TUBE, Vertical Extension (29-3/4" Lg.)	1
19			SERIAL NUMBER TAG (Reference Only)	1
20	015104 77D		SCREW, Vertical Tube, M6 x 12	8
21	015191 26D		SPACER, Bushing Adapter Plate Mounting	4

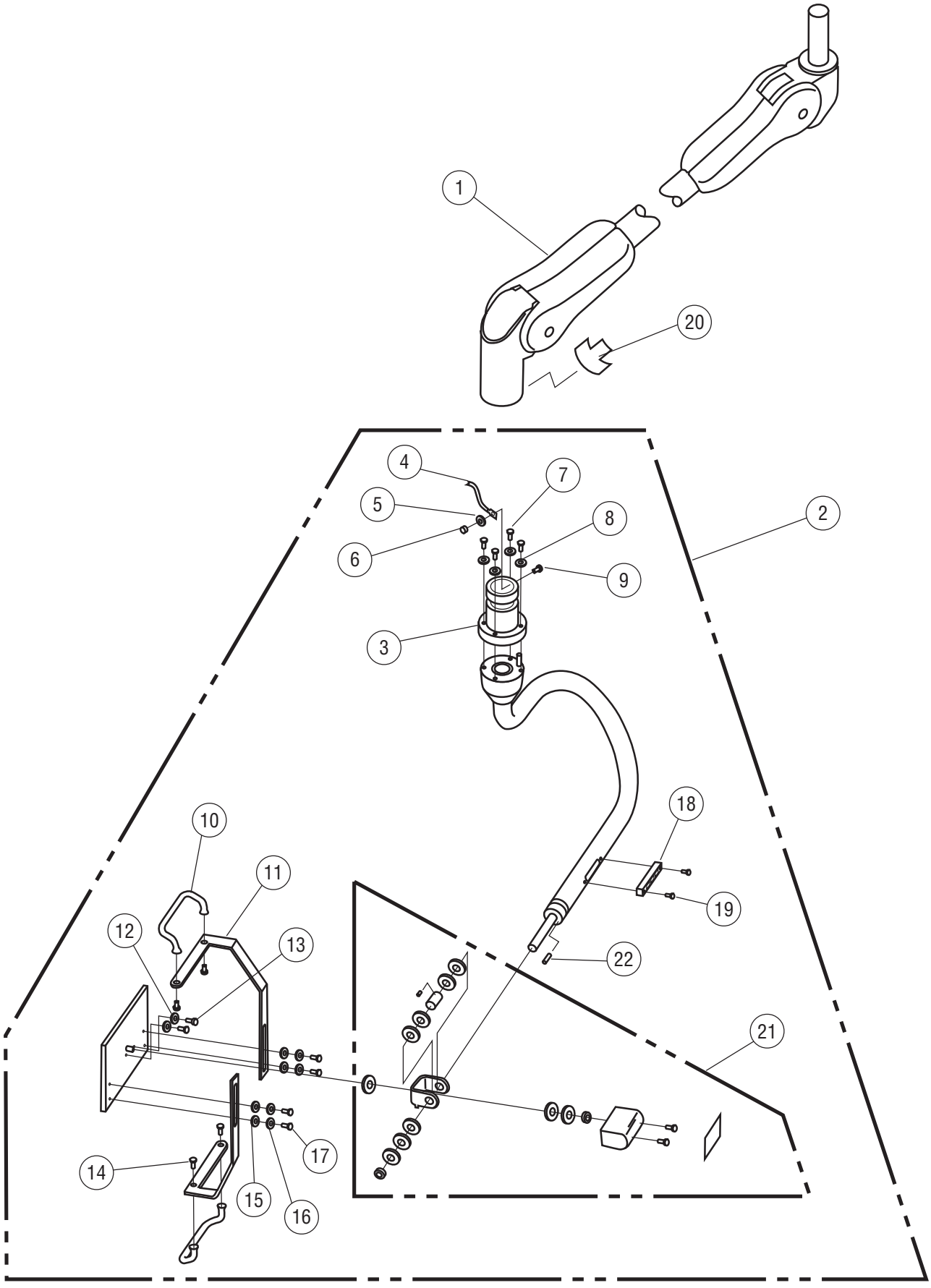


Figure 9-5A. Harmony LA Yoke - For Flat Panel Monitor

FIG. & INDEX NO.	PART NUMBER		SVC	DESCRIPTION	UNITS PER ASSEMBLY
9-5A-	18553	45D		SPRING ARM AND YOKE (FOR FLAT PANEL MONITOR)	X
1	18962	86D		SPRING ARM (See Figure 9-6)	1
2	015076	00D		YOKE, FPM	1
3	015086	55D		• MOUNTING HUB, FPM	1
4	015052	96D		• GROUND STRAP, 350 mm Lg	1
5	000110	53D		• WASHER, Lock	2
6	000172	49D		• CAP, Blanking, M4-A2	1
7	015086	35D		• SCREW, M5 x 20	4
8	000628	65D		• WASHER, Lock	4
9	015117	99D		• SCREW, M4 x 14	1
10	015084	69D		• HANDLE	2
11	015086	29D		• BRACKET, Handle	2
12	015081	84D		• WASHER, M6	2
13	015081	69D		• SCREW, Stop, M6 x 10	2
14	015090	41D		• SCREW, M5 x 16	4
15	015081	63D		• WASHER, B6	4
16	015081	84D		• WASHER	4
17	015095	04D		• SCREW, Cap, M6 x 16	4
18 P	093926	204	*	• CLAMP, Cable	1
19 P	129382	432	*	• SCREW, Phillips Head, M3.5 x 16	2
20	000157	17D		• KEEPER, Ring	1
21	018892	26D	**	KIT, Spare Parts for FPM	1
22	000172	26D		PIN, Stop	1

**Not included with Spring Arm and Yoke*

*** Components are not available individually.*

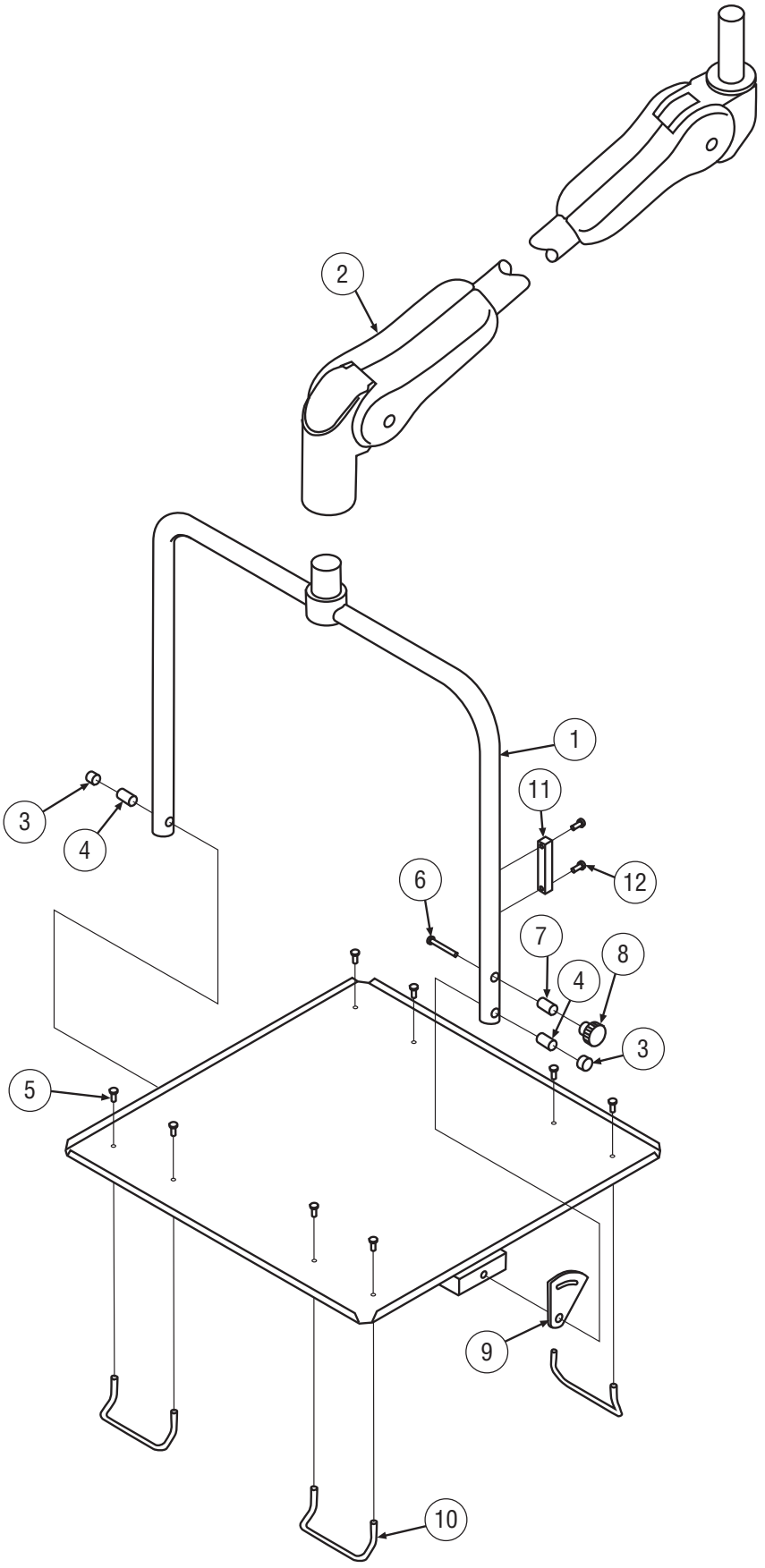


Figure 9-5B. Harmony LA Yoke - For CRT Monitor

FIG. & INDEX NO.	PART NUMBER		SVC	DESCRIPTION	UNITS PER ASSEMBLY
9-5B-	18548	28D		SPRING ARM AND YOKE (FOR CRT MONITOR)	X
1	015075	80D	*	YOKE, CRT	1
2	018962	87D	*	SPRING ARM, CRT (See Figure 9-6)	1
3				SCREW	2
4				SPACER	2
5				SCREW	8
6				SCREW	1
7				SPACER	1
8				KNOB	1
9				PLATE, Adjusting	1
10				HANDLE	4
11	P 093926	204		CABLE MOUNTING ASSEMBLY	1
12	P 129382	432		SCREW	2
13				LABEL, Serial Number (Reference Only) (Not Shown)	1
				** Components are not available individually.*	

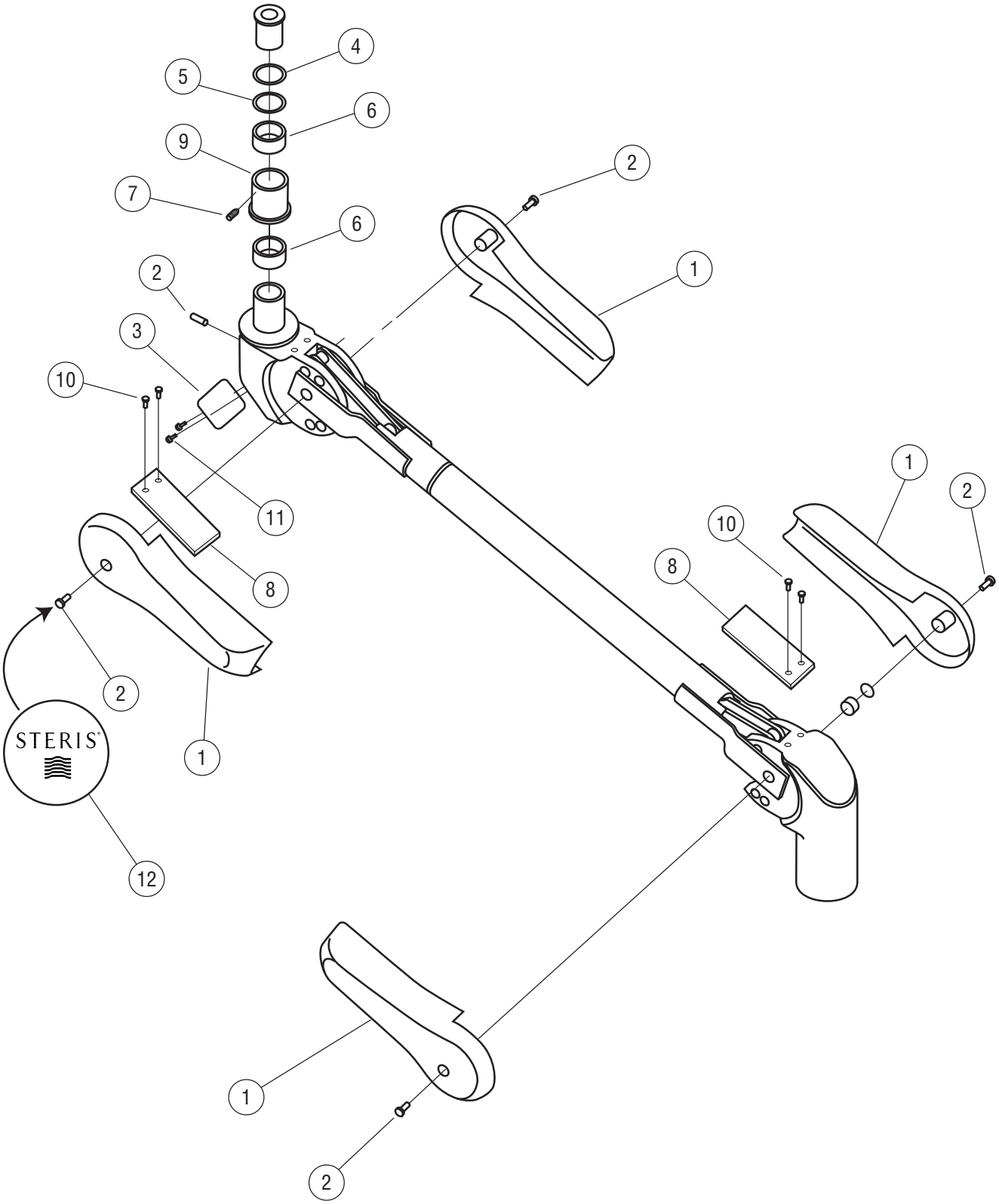


Figure 9-6. Harmony LA Spring Arms For FPM And CRT

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY	
9-6-	18962 86D	*	SPRING ARM, w/Harness (FOR FLAT PANEL MONITOR)	X	
	18962 87D	*	SPRING ARM, w/Harness (FOR CRT)		X
1	015068 13D		COVER	4	4
2	000375 91D		SCREW, M4 x 6	4	4
3	015075 85D		COVER, Access	1	1
4	000157 82D		SAFETY RING, 40 x 1.75	1	1
5	000157 27D		WASHER, 40 x 50 x 0.5	1	1
6	000104 65D		BEARING	2	2
7	015136 51D		SCREW, Brake	2	2
8	000373 87D		GUARD, S/S Knuckle	4	4
9	015073 99D		ADAPTER	1	1
10	000167 94D		SCREW, S/S Guard	8	8
11	015040 74D		SCREW, DIN 7991 – M4 x 8	2	2
12	015110 68D		LABEL, STERIS	4	4

** Only noted components are available.*

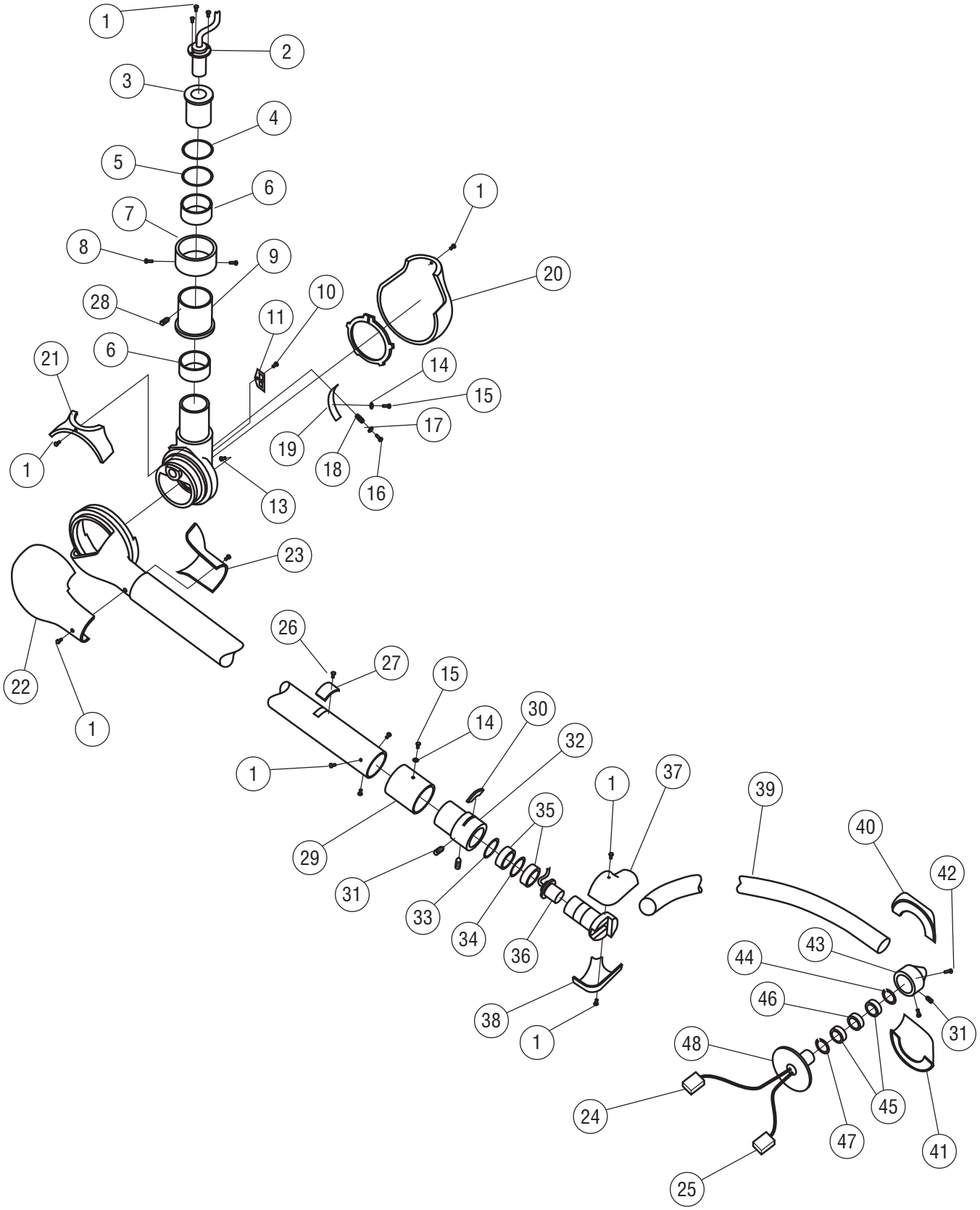


Figure 9-7. Harmony LA Spring Arm/Yoke - For Medium Lighthead

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-7-		018548	27D		SPRING ARM/YOKE ASSEMBLY (MED LIGHTHEAD/CENTER MOUNT)	X			
		018681	12D		SPRING ARM/YOKE ASSEMBLY (MED LIGHTHEAD/MOBILE STAND)		X		
1		000169	95D		SCREW, DIN 7985 - M3 x 8	12	12		
2		015083	95D		COMMUTATOR, Small	1	–		
3		015067	96D		ADAPTER, Commutator	1	–		
4		000157	82D		SAFETY RING, 40 x 1.75	1	1		
5		000157	27D		WASHER, 40 x 50 x 0.5	1	1		
6		000104	65D		BEARING, Needle	2	–		
7		015070	57D		NUT, M65 x 2	1	–		
8		000114	29D		PIN, Threaded, DIN 916 - M4 x 4	2	–		
9		015068	01D		BUSHING, Bearing	1	–		
10		000375	91D		SCREW, MLF, M4 x 6	1	1		
11		015070	65D		PLATE, Connector	1	1		
12	P	136820	281		SET, Suspension Arm Label, 1 thru 4 (Not Shown)	1	–		
13		000629	94D		SCREW, DIN 912 - M6 x 10	1	1		
14		000618	68D		WASHER, DIN 6798 - V4,3	5	5		
15		015040	74D		SCREW, Sink, DIN 7991 - M4 x 8	12	12		
16		015044	53D		PIN, Threaded, DIN 915 - M6 x 16	1	1		
17		000173	98D		WASHER, DIN 433 - V4,3	1	1		
18		000197	55D		SPRING, Pressure	1	1		
19		015083	94D		BRAKE SEGMENT	1	1		
20		015067	68D		COVER, Knuckle, Upper Outside	1	1		
21		015067	69D		COVER, Knuckle, Upper Inside	1	1		
22		015067	70D		COVER, Knuckle, Lower Outside	1	1		
23		015067	71D		COVER, Knuckle, Lower Inside	1	1		
24	P	755717	301		HARNESS, Test/Repair, DC Wires	1	1		
25	P	755717	302		HARNESS, Test/Repair, Camera/Com	1	1		
26		000394	53D		SCREW, Sink, DIN 966 - M3 x 4-4.8-H-VALE	1	1		
27		015070	56D		COVER, Tube	1	1		
28		015136	51D		SCREW, Brake	2	2		
29		015070	55D		COVER, Sleeve	1	1		
30		015067	91D		KEY, Locking	1	1		
31		000358	99D		SCREW, Brake, M10 x 1	4	4		
32		015067	67D		BUSHING, Bearing	1	1		
33		000618	68D		WASHER, DIN 6798 - V4.3 VZK	1	–		
34		000143	37D		SAFETY RING, SB 40	3	3		
35		000143	36D		BEARING, Needle, 35 x 40 x 13	2	2		
36		015083	96D		COMMUTATOR, Small	1	1		
37		015068	08D		COVER, Yoke Bottom	1	1		
38		015068	09D		COVER, Yoke Top	1	1		
39					YOKE (Not Available)	1	1		
40		015068	10D		COVER, Lighthead Top	1	1		
41		015068	11D		COVER, Lighthead Bottom	1	1		
42		000144	58D		SCREW, Pan Head, DIN 7985 - M3 x 6	2	2		
43					PIVOT, LL w/Stop (Not Available)	1	1		
44		015072	14D		SAFETY RING, DIN 471 - A25 x 1.2	1	1		
45		015072	15D		BEARING, Ball, 61905-2RZ	2	2		
46		015070	48D		BRAKE, Ring, SB40 Seeger	1	1		
47		000644	14D		SAFETY RING, DIN 472 - 42 x 1.75	1	1		
48		015070	49D		MOUNT, Lighthead	1	1		

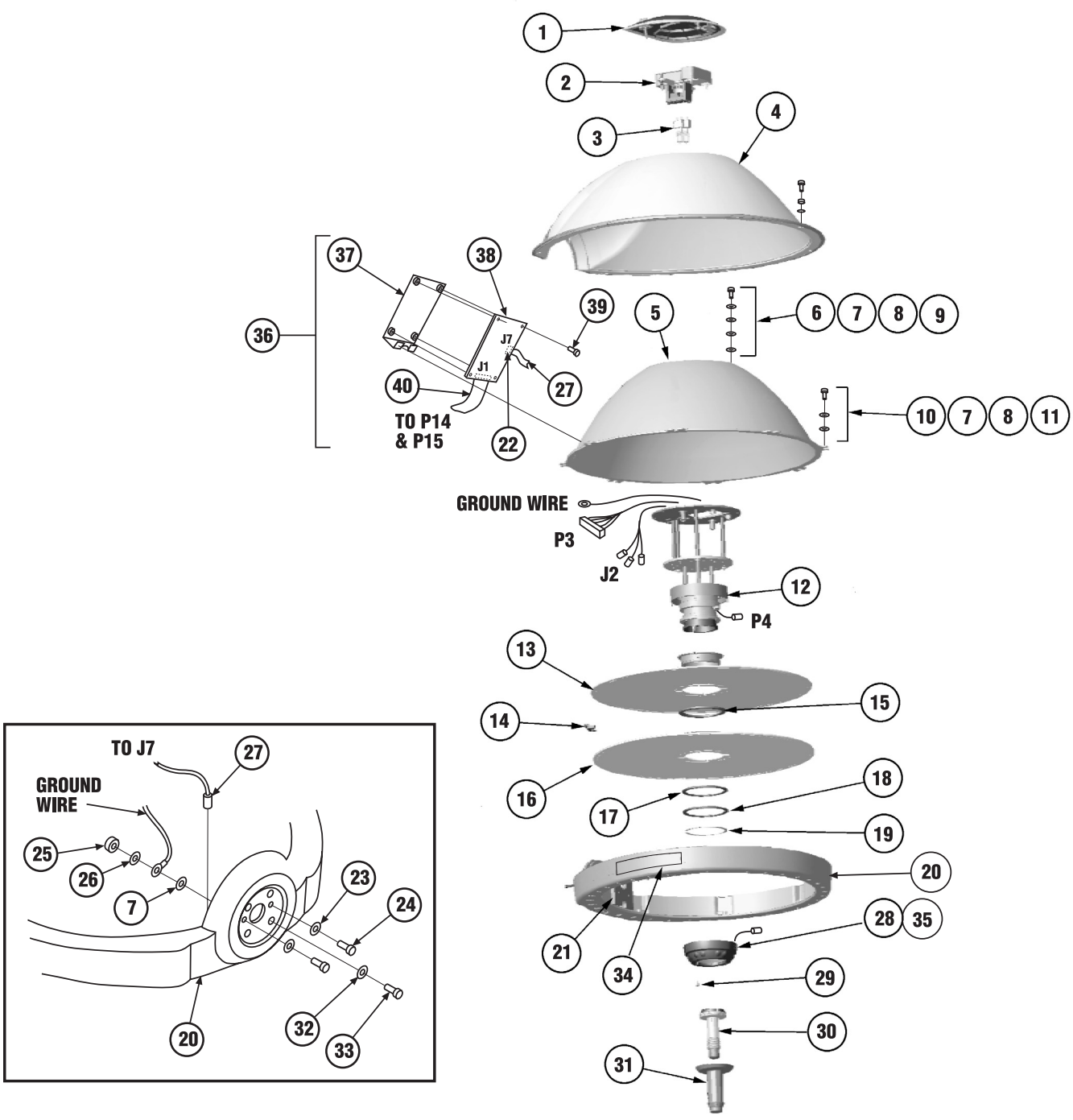


Figure 9-8A. Harmony LA 500 Lighthead

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-8A-	B	129382	391		HARMONY LA 500 LIGHTHEAD ASSEMBLY	X			
1	P	136820	084		HOOD ASSEMBLY, w/Latch	1			
	P	093926	077		LATCH ASSEMBLY, Quarter Turn	1			
2	P	146667	095		LAMP CHANGE ASSEMBLY	1			
3	P	093926	047		LAMP	1			
4	P	146667	087		COVER, w/Captive Screws	1	X		
	P	129382	215		• SCREW, Button Head Cap, #8-32 x 5/8 Special		7		
	P	129382	217		• WASHER, Split		7		
	P	129382	216		• INSERT, Compression Limiter		7		
5	P	146667	005		REFLECTOR	1			
6	P	050527	061		SCREW, Socket Head Cap, #8-32 x 1.2" Lg	8			
7	P	019690	061		WASHER, Lock, #8	29			
8	P	129382	244		WASHER, #10	24			
9	P	129382	247		SPACER, Rubber	8			
10	P	129359	324		SCREW, Socket Head Cap, #8-32 x 3/4" Lg	8			
11	P	129382	245		WASHER, #10, Bonded	8			
12	P	146667	086		HUB ASSEMBLY (See Figure 9-8C)	1			
13	P	146667	077		LENS	1			
14	P	093926	081		CLIP, Lens	8			
15	P	093926	078		SPACER, Lens	1			
16	P	146667	050		LENS, Coated	1			
17	P	093926	079		GASKET, Lens	1			
18	P	093926	080		CLAMP, Outer Lens	1			
19	P	129382	078		RING, Retaining, 3.625 Ext	1			
20	P	146667	076		BASE, w/Overmold	1			
21	P	136820	025		PIVOT FLANGE RETAINER	1			
22	P	129382	358		PLUG, Connector	1			
23	P	084114	003		WASHER, #8	12			
24	P	129359	323		SCREW, Socket Head Cap, #8-32 x 1" Lg	2			
25	P	124354	010		NUT, #8	2			
26	P	079588	001		WASHER, Lock, #8, Int Tooth	1			
27	P	093926	112		HARNESS, Status LED	1			
28	P	146667	016		SWITCH BEZEL	1			
29	P	129356	135		SCREW, Socket Button Head Cap, #8-32 x 7/8" Lg	4			
30	P	136820	088		HANDLE ASSEMBLY, Standard	1			
31	P	136820	001		STERILE HANDLE	1			
	P	136820	355		STERILE HANDLE, Aluminum (Optional) (Not Shown)	1			
32	P	026962	061		WASHER, Lock, 1/4" Int Tooth	4			
33	P	041652	061		SCREW, Socket Head Cap, 1/4-20 x 1" Lg	4			
34	P	093926	314		LABEL, Product ID	2			
35	P	129382	414		LATCH, Mini Receptacle	1			
36	P	136820	016		PC BOARD ASSEMBLY	1		X	
37	P	136820	023		PC BOARD MOUNT ASSEMBLY			1	
38	P	146667	106		PC BOARD			1	
39	P	093908	033		SCREW, Phillips Head, #6-32 x 1/4"			4	
40	P	136820	122		HARNESS, J1 to P14, P15			1	

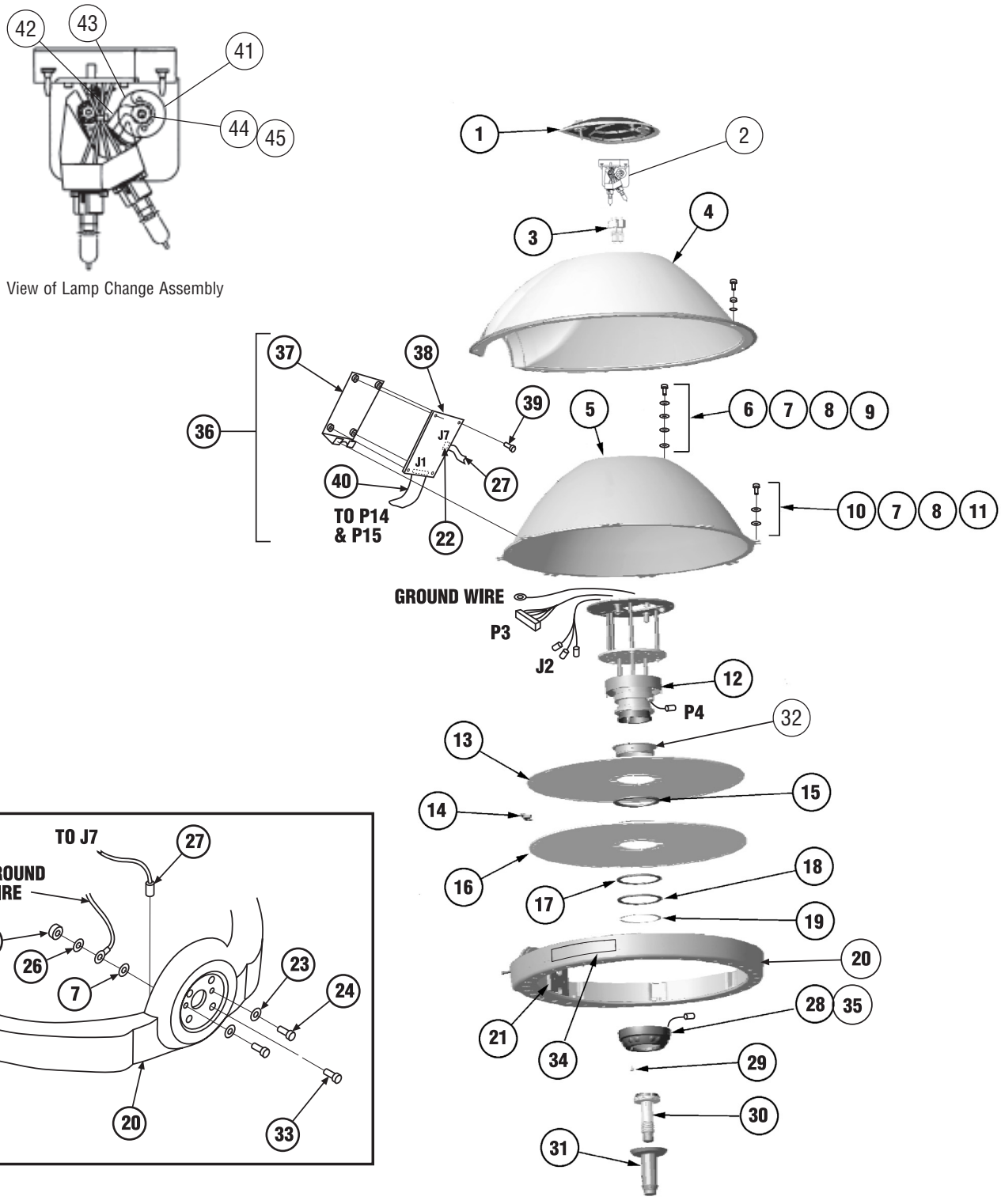


Figure 9-8B. Harmony LA 700 Lighthead

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-8B-	B	129382	393		HARMONY LA 700 LIGHTHEAD ASSEMBLY	X			
1	P	146667	115		HOOD ASSEMBLY, w/Latch	1			
	P	093926	077		LATCH ASSEMBLY, Quarter Turn	1			
2	P	146667	015		LAMP CHANGE ASSEMBLY	1			
3	P	093926	047		LAMP	1			
4	P	146667	113		COVER, w/Captive Screws	1	X		
	P	129382	215		• SCREW, Button Head Cap, #8-32 x 5/8 Special		7		
	P	129382	217		• WASHER, Split		7		
	P	129382	216		• INSERT, Compression Limiter		7		
5	P	146667	007		REFLECTOR	1			
6	P	050527	061		SCREW, Socket Head Cap, #8-32 x 1.2" Lg	8			
7	P	019690	061		WASHER, Lock, #8	29			
8	P	129382	244		WASHER, #10	24			
9	P	129382	247		SPACER, Rubber	8			
10	P	129359	324		SCREW, Socket Head Cap, #8-32 x 3/4" Lg	8			
11	P	129382	245		WASHER, #10, Bonded	8			
12	P	146667	029		HUB ASSEMBLY (See Figure 9-8C)	1			
13	P	146667	006		LENS	1			
14	P	093926	081		CLIP, Lens	8			
15	P	093926	078		SPACER, Lens	1			
16	P	146667	120		LENS, Coated	1			
17	P	093926	079		GASKET, Lens	1			
18	P	093926	080		CLAMP, Outer Lens	1			
19	P	129382	078		RING, Retaining, 3.625 Ext	1			
20	P	146667	018		BASE, w/Overmold	1			
21	P	136820	025		PIVOT FLANGE RETAINER	1			
22	P	129382	358		PLUG, Connector	1			
23	P	084114	003		WASHER, #8	12			
24	P	129359	323		SCREW, Socket Head Cap, #8-32 x 1" Lg	2			
25	P	124354	010		NUT, #8	2			
26	P	079588	001		WASHER, Lock, #8, Internal Tooth	1			
27	P	093926	112		HARNESS, Status LED	1			
28	P	146667	016		SWITCH BEZEL	1			
29	P	129356	135		SCREW, Socket Button Head Cap, #8-32 x 7/8" Lg	4			
30	P	136820	088		HANDLE ASSEMBLY, Standard	1			
31	P	136820	001		STERILE HANDLE	1			
	P	136820	355		STERILE HANDLE, Aluminum (Optional) (Not Shown)	1			
32	P	136820	078		CLAMP, Inner Lens	1			
33	P	041652	061		SCREW, Socket Head Cap, 1/4-20 x 1" Lg	4			
34	P	093926	315		LABEL, Product ID	2			
35	P	129382	414		LATCH, Mini Receptacle	1			
36	P	136820	016		PC BOARD ASSEMBLY	1		X	
37	P	136820	023		PC BOARD MOUNT ASSEMBLY			1	
38	P	146667	106		PC BOARD			1	
39	P	093908	033		SCREW, Phillips Head, #6-32 x 1/4"			4	
40	P	136820	122		HARNESS, J1 to P14, P15			1	
41	P	093926	010		SPACER, Sol.	1			
42	P	093926	011		LATCH	1			
43	P	093926	206		SOLENOID	1			
44	P	118449	061		WASHER, Lock, #5	2			
45	P	129382	066		NUT, Hex, #5-40	2			
46	P	146667	182		KIT, Packing Lighthead 500/700 (Not Shown)	1			

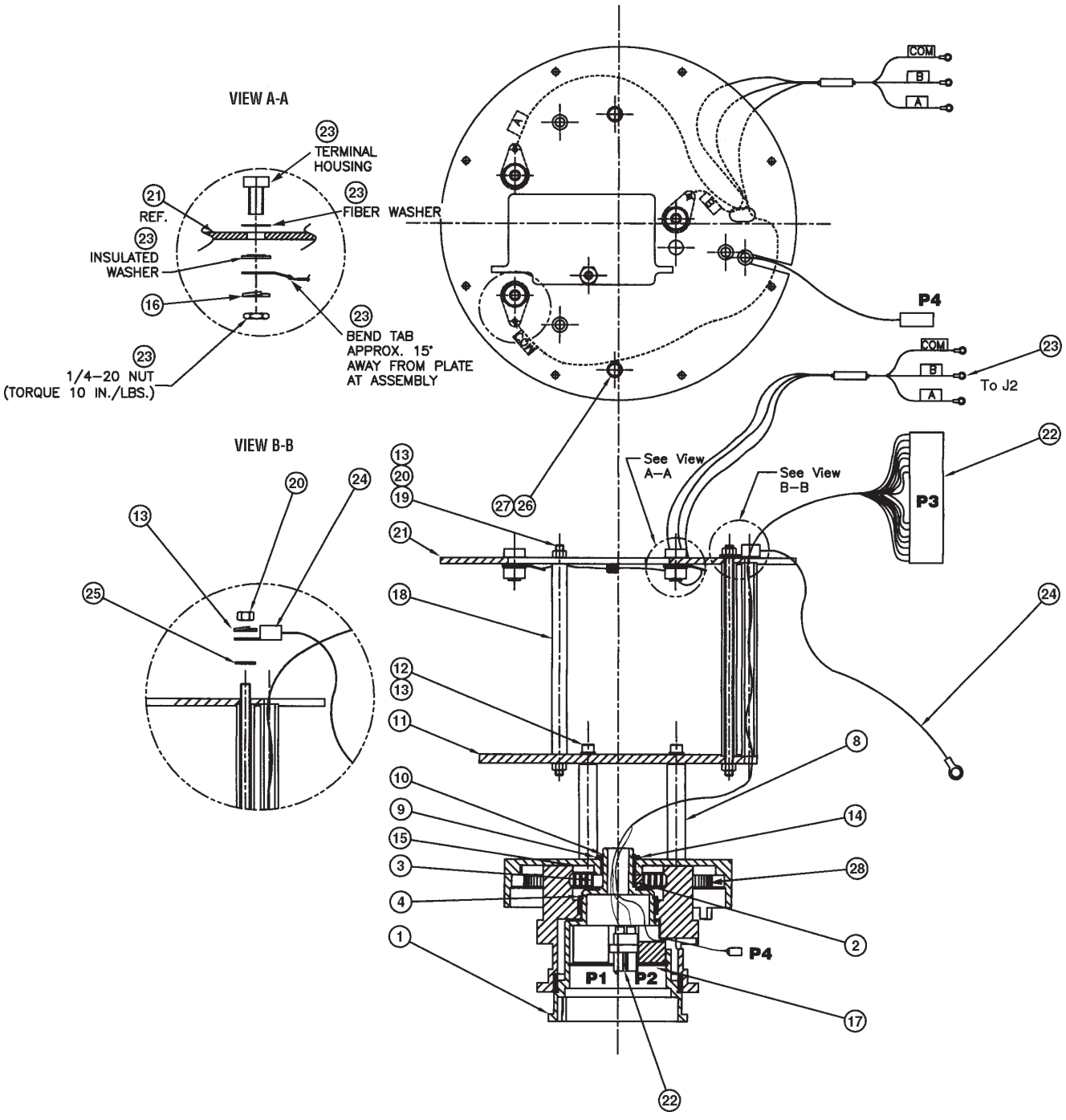
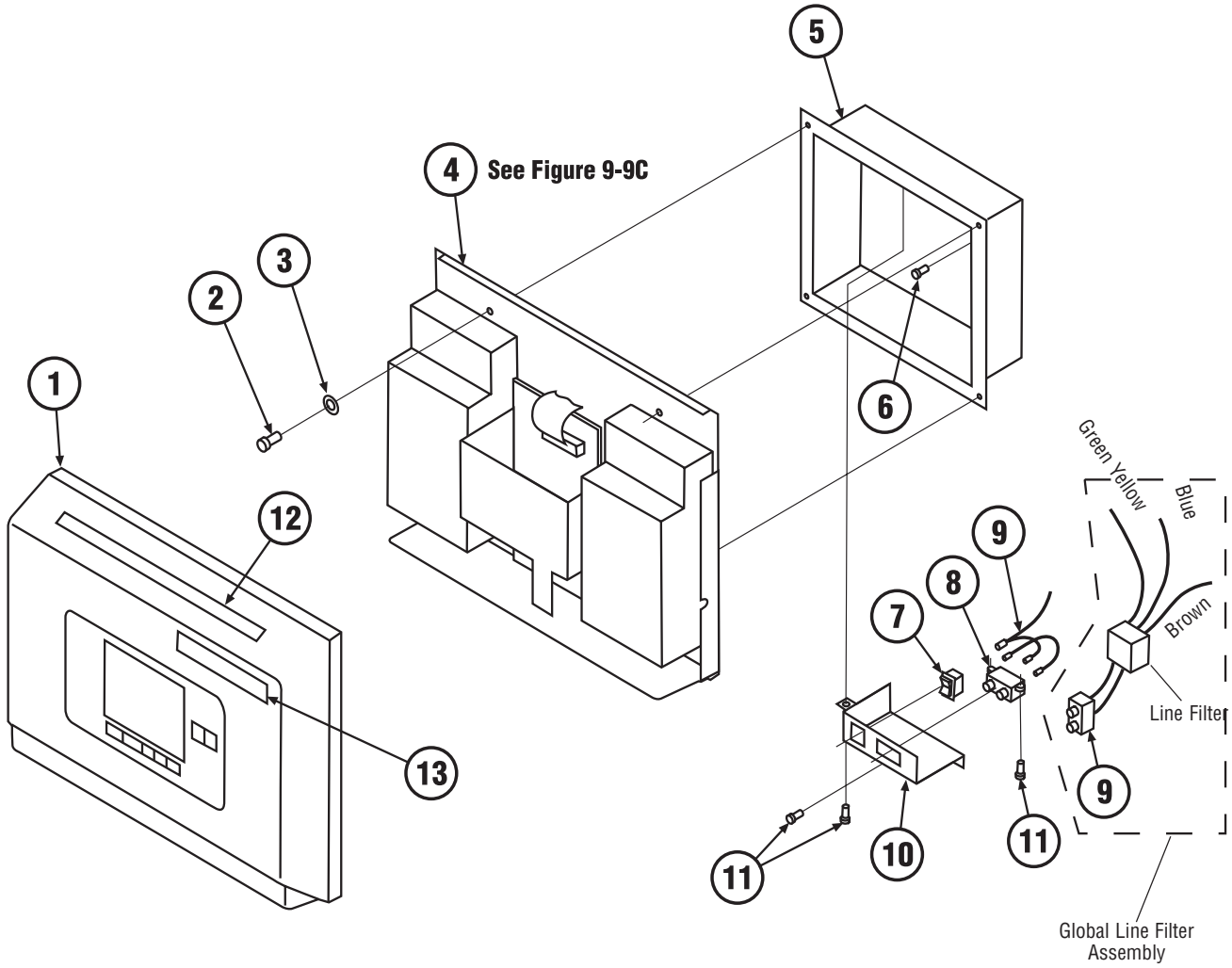


Figure 9-8C. Harmony LA Optical Hub

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-8C-	P	146667	086		HARMONY LA500 OPTICAL HUB	X			
	P	146667	029		HARMONY LA700 OPTICAL HUB		X		
1	P	146667	079		HANDLE ADAPTER, Aluminum	1	1		
2	P	129382	081		KEY, Steel	1	1		
3	P	129382	083		GEAR, Sun, Aluminum	1	1		
4	P	129382	097		RETAINING RING, 1.50, Ext Tooth	1	1		
5					Item Number Not Used				
6					Item Number Not Used				
7					Item Number Not Used				
8	P	129382	087		AXLE, 2.75 Lg	3	–		
	P	093926	015		AXLE, LA700	–	3		
9	P	129382	058		WASHER, Thrust	1	1		
10	P	129382	090		RETAINING RING, .625, Ext Tooth	1	1		
11	P	093926	087		PLATE, Aluminum	1	1		
12	P	129382	091		SCREW, Socket Head Cap, #8-32 x 3.50 Lg	3	–		
	P	093926	068		WELDMENT, Stud	–	3		
13	P	019690	061		WASHER, Lock, #8	9	9		
14	P	129382	073		BEARING, Flange, Thermoplastic	1	1		
15	P	093926	052		GASKET, Hub, Teflon	1	1		
16	P	019678	045		WASHER, Lock, 1/4-20	1	1		
17	P	129382	096		RETAINING RING, 2.00, Int Tooth	1	1		
18	P	093926	091		CONDUIT, Aluminum	3	–		
	P	093926	101		CONDUIT, LA700	–	3		
19	P	129382	099		STUD, #8-32	3	–		
	P	129382	045		STUD, #8-32	–	3		
20	P	124354	010		NUT, #8-32	6	6		
21	P	146667	081		CONTROL PLATE, Aluminum	1	1		
22	P	136820	117		HARNESS, Med, Control/Camera	1	–		
	P	136820	118		HARNESS, Large, Control/Camera	–	1		
23	P	136820	124		HARNESS, Med, PCB to Lamp	1	–		
	P	136820	125		HARNESS, Large, PCB to Lamp	–	1		
	P	129382	004		BANANA JACK, Lug Assembly	1	1		
24	P	093926	320		HARNESS, Ground	1	–		
	P	093926	238		HARNESS, Ground	–	1		
25	P	079588	001		WASHER, Lock, #8, Int Tooth	1	1		
26	P	129382	234		RECEPTACLE	2	2		
27	P	129382	235		NUT, Retaining	2	2		



Global Serial Numbers

The following are "Global" Harmony LA Surgical Light STERIS Montgomery Serial Numbers (part number 146667-327);

1. Any Standard wall control, Remote Power Module or Low Profile Control with a suffix of "G". Example: 0415205022G
2. Any year 2004 wall controls with the serial numbers from this list (may or may not have a G suffix);
   - 0422204054 thru 0422204073
   - 0431604091 thru 0431604110
   - 0434504061 thru 0434504093
   - 0435104010 thru 0435104042
   - 0436304131 thru 0436304163
3. Any year 2005 wall controls with serial numbers 0402505122 or higher.

***NOTE**: Only six wall controls were made of the old version (146667-035) in 2005: 0401105-013, -014, -044, -045, -046, -047.*

Figure 9-9A. Harmony LA Wall Control Assembly

HOW ARE THE CABLES SUPPLIED?			PART #						CONNECTIONS	
INCLUDED WITH:	ACCESSORY *	EQUIPMENT #	KIT	CABLE	DESCRIPTION	LENGTH	QUANTITY	PURPOSE	END–1	END–2
POWER CABLES										
STD CONTROL CENTER AND RPM				093926–018	POWER CABLE, 12 AWG, JACKETED, 2 CONDUCTOR	30 FT.	1 PER LIGHTHEAD	CARRY LIGHTHEAD POWER FROM THE POWER SUPPLY TO THE HUB	STD CNTRL CTR OR RPM	PRIMARY OR SECONDARY HUB
	LONG RUN DBL POWER CABLE	LB00–0041		093926–240	DOUBLE POWER CABLE, 12 AWG, JACKETED, 2X2 CONDUCTOR, LONG RUN	56 FT.				
	LONG RUN DBL POWER CABLE PLENUM RATED	LB00–0042		093926–241	DOUBLE POWER CABLE, 12 AWG, JACKETED, 2X2 CONDUCTOR, LONG RUN, PLENUM RATED	56 FT.				
VIDEO CABLES										
STD CONTROL CENTER AND RPM				093926–318	VIDEO CABLE	32 FT.	1 PER CONTROL CENTER	CARRY CAMERA VIDEO SIGNALS FROM HUB TO CONTROL CENTER	STD CNTRL CTR	HUB INTERFACE BOARD
	LONG RUN VIDEO AND COMM KIT	LB00–0043	136820–268	136820–264	VIDEO CABLE, LONG RUN	58 FT.				
	LONG RUN VIDEO AND COMM KIT PLENUM RATED	LB00–0044	136820–269	136820–266	VIDEO CABLE, LONG RUN, PLENUM RATED	58 FT.				
COMMUNICATION CABLES										
STD CONTROL CENTER AND RPM				093926–021	COMMUNICATION CABLE	32 FT.	1 PER CONTROL CENTER	CARRY SIGNALS BETWEEN CONTROL CENTER AND THE HUB	STD CNTRL CTR	HUB INTERFACE BOARD
	LONG RUN VIDEO AND COMM KIT	LB00–0043	136820–268	136820–265	COMMUNICATION CABLE, LONG RUN	58 FT.				
	LONG RUN VIDEO AND COMM KIT PLENUM RATED	LB00–0044	136820–269	136820–267	COMMUNICATION CABLE, LONG RUN. PLENUM RATED	58 FT.				
	HUB EXTENSION CABLE KIT	LB13–000–000	136820–200	093926–232	HUB EXTENSION CABLE KIT, PLENUM RATED	24 FT.	1 PER EACH LIGHTHEAD ON SECONDARY HUB	CARRY SIGNALS BETWEEN PRIMARY AND SECONDARY HUB	HUB INTERFACE BOARD ON PRIMARY HUB	SECONDARY HUB
REMOTE POWER MODULE (RPM)				093926–329	REMOTE POWER / STATUS CABLE KIT, PLENUM RATED	32 FT.	1 PER SINGLE RPM, 2 PER DUAL RPM	CARRY SIGNALS FROM RPM TO CONTROL CENTER	STD CNTRL CTR	RPM
DEEPSITE				093926–325	DEEPSITE COMMUNICATION	32 FT.	1	CARRY SIGNALS FROM DEEPSITE TO CONTROL CENTER	STD CNTRL CTR	ILLUMINATOR

* NON STANDARD AND MUST BE PURCHASED SEPERATELY.

Figure 9-9B. Harmony LA Wall Control Assembly - Cables (Table)

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-9A-	P	146667	035		HARMONY LA WALL CONTROL ASSEMBLY	X			
	P	146667	327		HARMONY LA WALL CONTROL ASSEMBLY, GLOBAL				X
1	P	146667	278	*	COVER/MEMBRANE REPLACEMENT ASSEMBLY	1			1
2	P	042631	045		SCREW, Socket Button Head, 1/4-20	4			4
3	P	076230	091		WASHER, Lock, 1/4 Ext Tooth	4			4
4	P	146667	111		WALL PANEL ASSEMBLY (See Figure 9-9B)	1			–
	P	146667	231		WALL PANEL ASSEMBLY – Global (See Figure 9-9D)	–			1
5	P	146667	112		ROUGH-IN BOX	1		X	–
	P	146667	225		ROUGH-IN BOX ASSEMBLY, Global	–			1
6	P	082675	001		SCREW, Ground, #10-32 x 3/8" Green			1	1
7	P	129378	037		SWITCH, Rocker Power			1	1
8	P	093926	309		FILTER, AC Line			1	–
9	P	136820	288		WIRING SET, Main Terminal			1	–
	P	136820	234		ASSEMBLY, Wiring Harness, Global (inc. Global Line Filter)			–	1
10	P	093026	016		SHIELD, AC Line Filter			1	–
	P	136820	233		SHIELD, Pem/Asm.			–	1
11	P	093908	033		SCREW, Sems, #6-32 x 1/4" Lg			4	4
12	P	093926	319		LABEL, Warning, Electric Shock Hazard		1		1
13	P	093926	324		LABEL, Product ID		1		1
14	P	093926	264		EMI SUPPRESSOR, Clamp-on (Not Shown)	1			–
15	P	146667	186		CONTROL CENTER PACKING KIT (Not Shown)				1
16	P	146667	286		PACKING KIT, Shipping Bracket (Not Shown)				1
					** order labels items 12 & 13 when replacing front cover*				

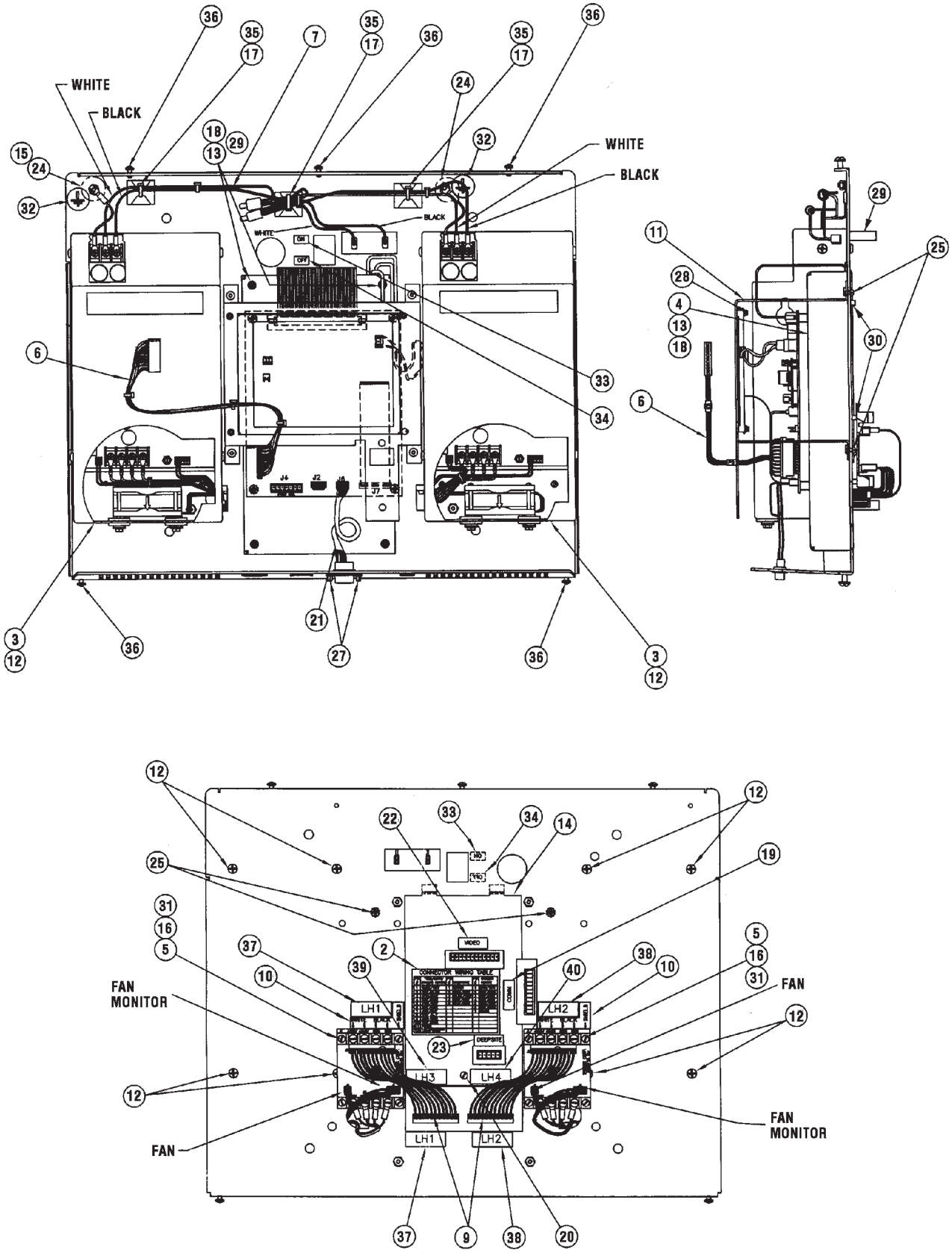


Figure 9-9C. Harmony LA Wall Control Panel Assembly

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY
9-9C- 1	P	146667	111		HARMONY LA WALL CONTROL PANEL ASSEMBLY	X
2	P	129382	419		LABEL, Connector Wiring, (Back Plate)	1
3	P	146667	008		POWER BOX ASSEMBLY	2
4	P	136820	010		MASTER CONTROLLER ASSEMBLY (See Figure 9-9E)	1
5	P	136820	101		POWER/STATUS BOARD, Standard	2
6	P	136820	285		CABLE ASSEMBLY, Keypad to LCD Interface	1
7	P	136820	286		WIRING HARNESS ASSEMBLY	1
8					Item Number Not Used	
9	P	093926	040		CABLE, Status Control	2
10	P	129382	424		LABEL, Power Status Wiring	2
11	P	146667	281		LCD DISPLAY ASSEMBLY (See Figure 9-9F)	1
12	P	412984	027		SCREW, Flat Head, #8-32 x 1/4" Lg	8
13	P	003966	041		SCREW, Round Head #6-32 x 1-1/4" Lg	4
14	P	136820	292		COVER, Access	1
15	P	118432	061		NUT, Hex #6-32	2
16	P	129362	208		SCREW, Phillips Sems, #4-40 x 3/4" Lg	8
17	P	084104	001		WIRE TIE	3
18	P	019684	061		WASHER, Lock, #6	6
19	P	129382	334		LABEL, Comm	1
20	P	081681	006		SCREW, Slotted Round Head, #4-40 x 1/4" Lg	1
21	P	093926	039		CABLE	1
22	P	129382	335		LABEL, Video	1
23	P	129382	333		LABEL, DeepSite	1
24	P	129382	054		STUD, #6-32 x 3/8" Lg	2
25	P	093908	033		SCREW, Sems, #6-32 x 1/4" Lg	4
27	P	129380	078		STAND-OFF KIT	1
28	P	091146	062		WASHER, Lock	2
29	P	129382	056		STAND-OFF, #6-32 x 1" Lg	7
30	P	129382	055		STAND-OFF, #4-40 x 3/8" Lg	12
31	P	090713	061		WASHER, Lock, #4	8
32	P	129360	483		STICKER, Natural Ground	2
33	P	129382	348		LABEL, On	1
34	P	129382	349		LABEL, Off	1
35	P	150476	930		MOUNTING BASE	5
36	P	129362	383		SCREW, Pan Head w/Washer, #6-32 x 3/8" Lg	5
37	P	129382	420		LABEL, LH1	2
38	P	129382	421		LABEL, LH2	2
39	P	129382	422		LABEL, LH3	1
40	P	129382	423		LABEL, LH4	1

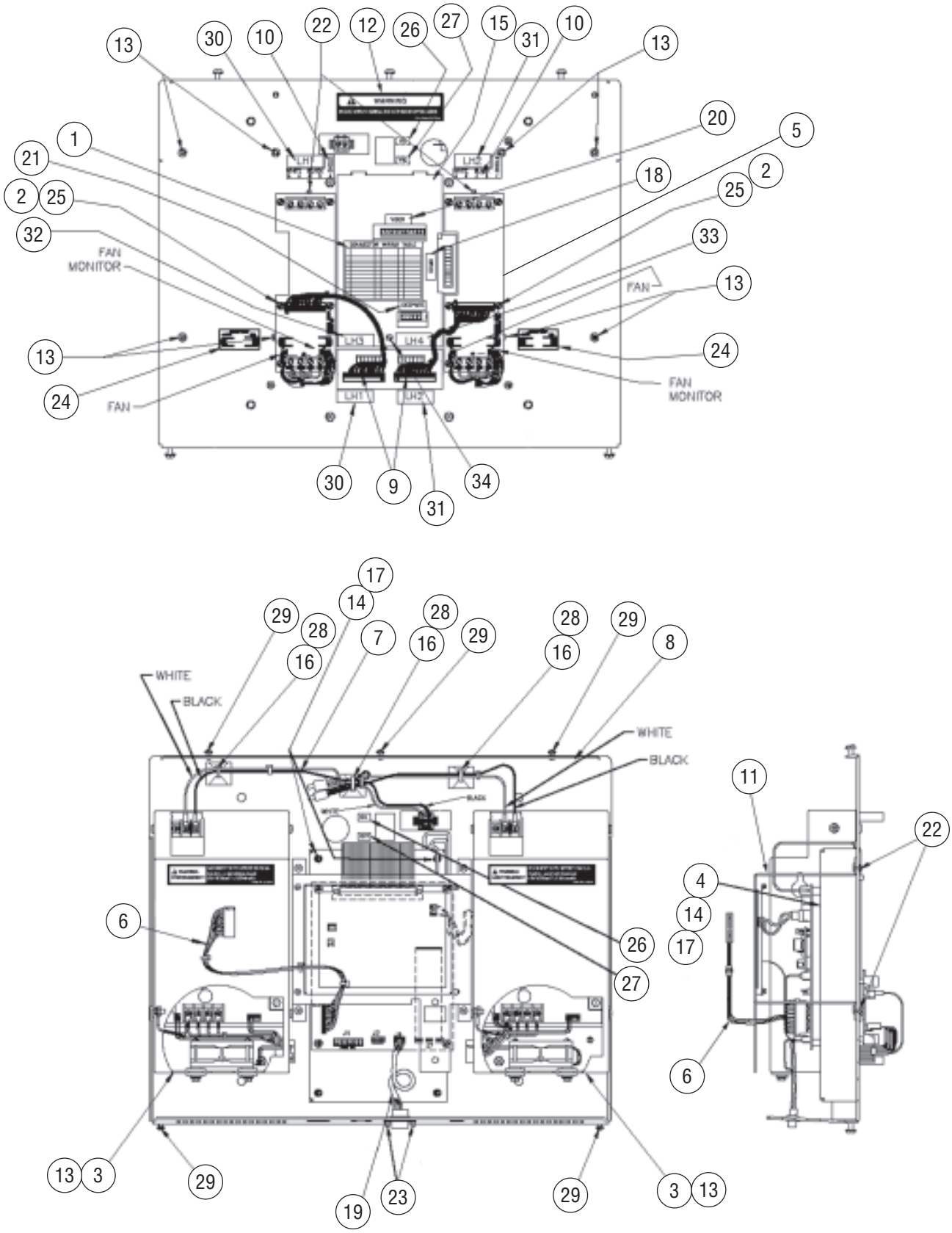


Figure 9-9D. Harmony LA Wall Control Panel Assembly (Global)

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY
9-9D-	P	146667	231		HARMONY LA WALL CONTROL PANEL ASSEMBLY (GLOBAL)	X
1	P	129382	687		LABEL, Connector Wiring, (Back Plate)	1
2	P	081681	006		SCREW, Slotted Round Head, #4-40 x 1/4" Lg	1
3	P	146667	330		POWER BOX ASSEMBLY	2
4	P	136820	010		MASTER CONTROLLER ASSEMBLY (See Figure 9-9E)	1
5	P	136820	103		BOARD, Back-Up Power/Status	2
6	P	136820	285		CABLE ASSEMBLY, Keypad to LCD Interface	1
7	P	136820	311		ASSEMBLY, Wiring Harness	1
8	P	146667	119		ASSEMBLY, Wall Unit Panel	1
9	P	093926	410		CABLE, Status Control	2
10	P	129382	424		LABEL, Power Status Wiring	2
11	P	146667	281		LCD DISPLAY ASSEMBLY (See Figure 9-9F)	1
12	P	129382	684		LABEL, Warning (Wiring Change)	1
13	P	412984	027		SCREW, Flat Head, #8-32 x 1/4" Lg	8
14	P	003966	041		SCREW, Round Head #6-32 x 1-1/4" Lg	4
15	P	136820	292		COVER, Access	1
16	P	084104	001		WIRE TIE	3
17	P	019684	061		WASHER, Lock, #6	6
18	P	129382	334		LABEL, Comm	1
19	P	093926	039		CABLE, Service Port	1
20	P	129382	335		LABEL, Video	1
21	P	129382	333		LABEL, DeepSite	1
22	P	093908	033		SCREW, Sems, #6-32 x 1/4" Lg	4
23	P	129380	078		STAND-OFF KIT	1
24	P	129382	581		LABEL, Battery Input	2
25	P	090713	061		WASHER, Lock, #4	12
26	P	129382	348		LABEL, On	1
27	P	129382	349		LABEL, Off	1
28	P	150476	930		MOUNTING BASE	5
29	P	129362	383		SCREW, Pan Head w/Washer, #6-32 x 3/8" Lg	5
30	P	129382	420		LABEL, LH1	2
31	P	129382	421		LABEL, LH2	2
32	P	129382	422		LABEL, LH3	1
33	P	129382	423		LABEL, LH4	1
34	P	081681	006		SCREW, Round Head, #4-40 x 1/4"	1

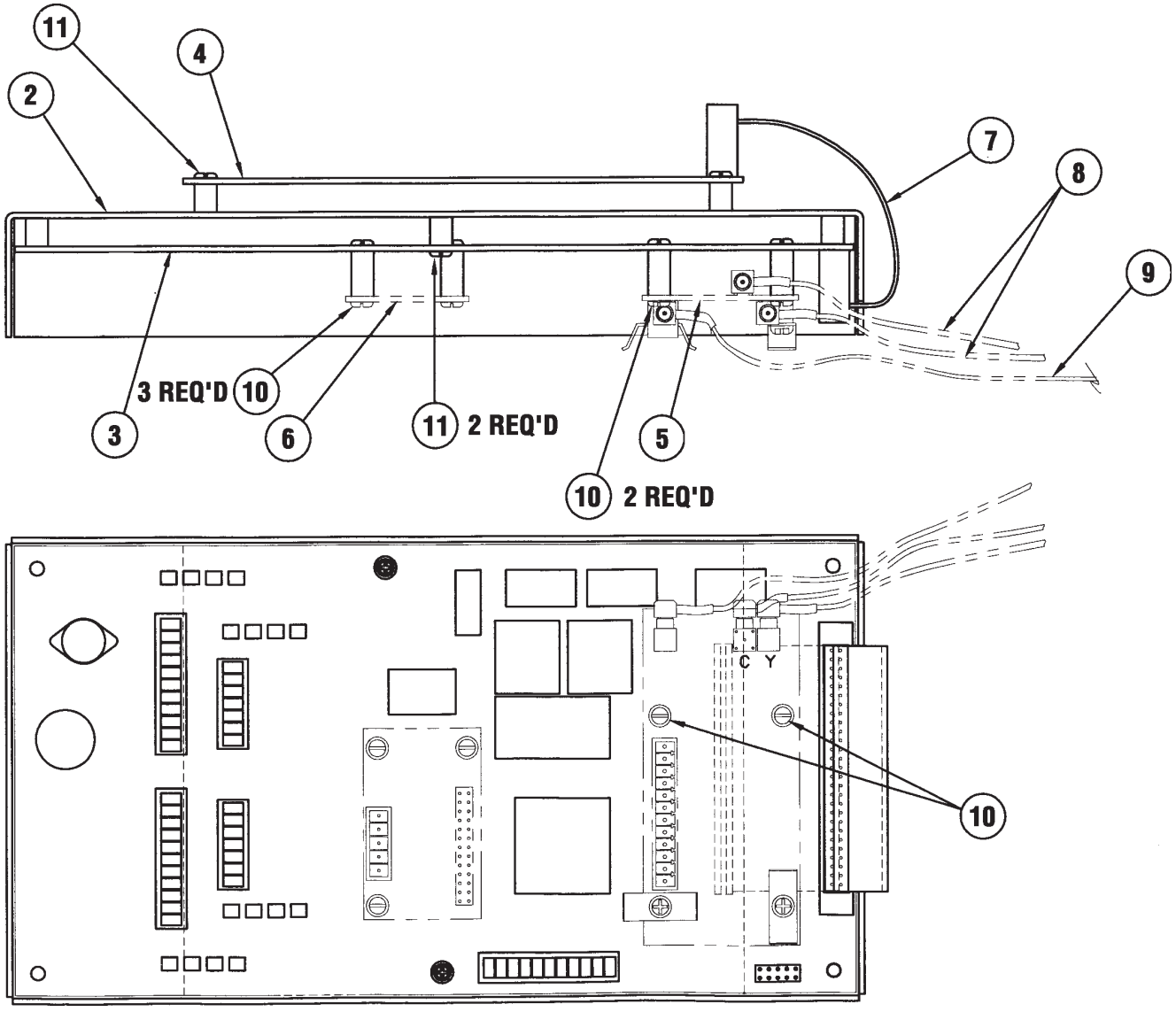


Figure 9-9E. Harmony LA Master Controller Assembly

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-9E- 1	P	136820	010		HARMONY LA WALL MASTER CONTROLLER ASSEMBLY	X			
2	P	136820	014		SHIELD, PCB	1			
3	P	146667	101		MASTER CONTROL PCB ASSEMBLY	1			
4	P	146667	104		LCD INTERFACE PCB ASSEMBLY	1			
5	P	136820	107		VIDEO INTERFACE PCB ASSEMBLY (Reference Only).....	–			
6	P	136820	109		DEEPSITE INTERFACE PCB ASSEMBLY (Reference Only)	–			
7	P	093926	038		CABLE, Control/LCD	1			
8	P	136820	283		CABLE, S-Video (Reference Only)	–			
9	P	093926	022		CABLE, Composite Video (Reference Only).....	–			
10	P	093908	031		SCREW, Phillips Head Sems, #4-40 x 1/4 Lg (Reference Only)	–			
11	P	093908	039		SCREW, Phillips Head Sems, #6-32 x 3/8 Lg	6			

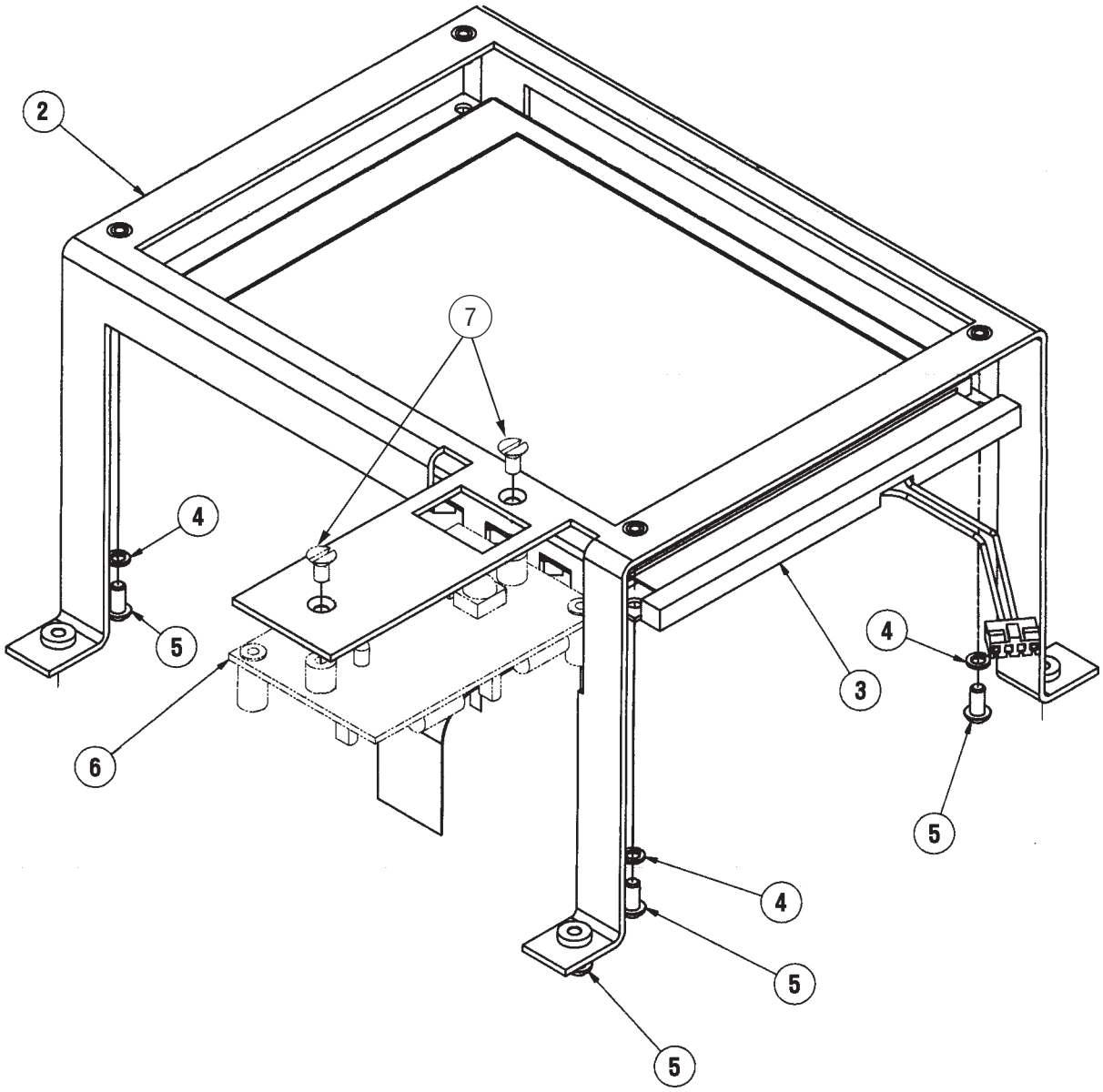


Figure 9-9F. Harmony LA LCD Display Assembly

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY
9-9F- 1	P	146667	281		HARMONY LA LCD DISPLAY ASSEMBLY	X
2	P	136820	291		BRACKET ASSEMBLY, LCD Display	1
3	P	136820	021		MODULE, LCD Display	1
4	P	081682	003		WASHER, Lock, #4	4
5	P	081681	006		SCREW, Round Head, #4-40 x 1/4"	4
6	P	129378	100		IR RECEIVER BOARD (Reference Only)	–
7	P	045176	044		SCREW, IR Board	2

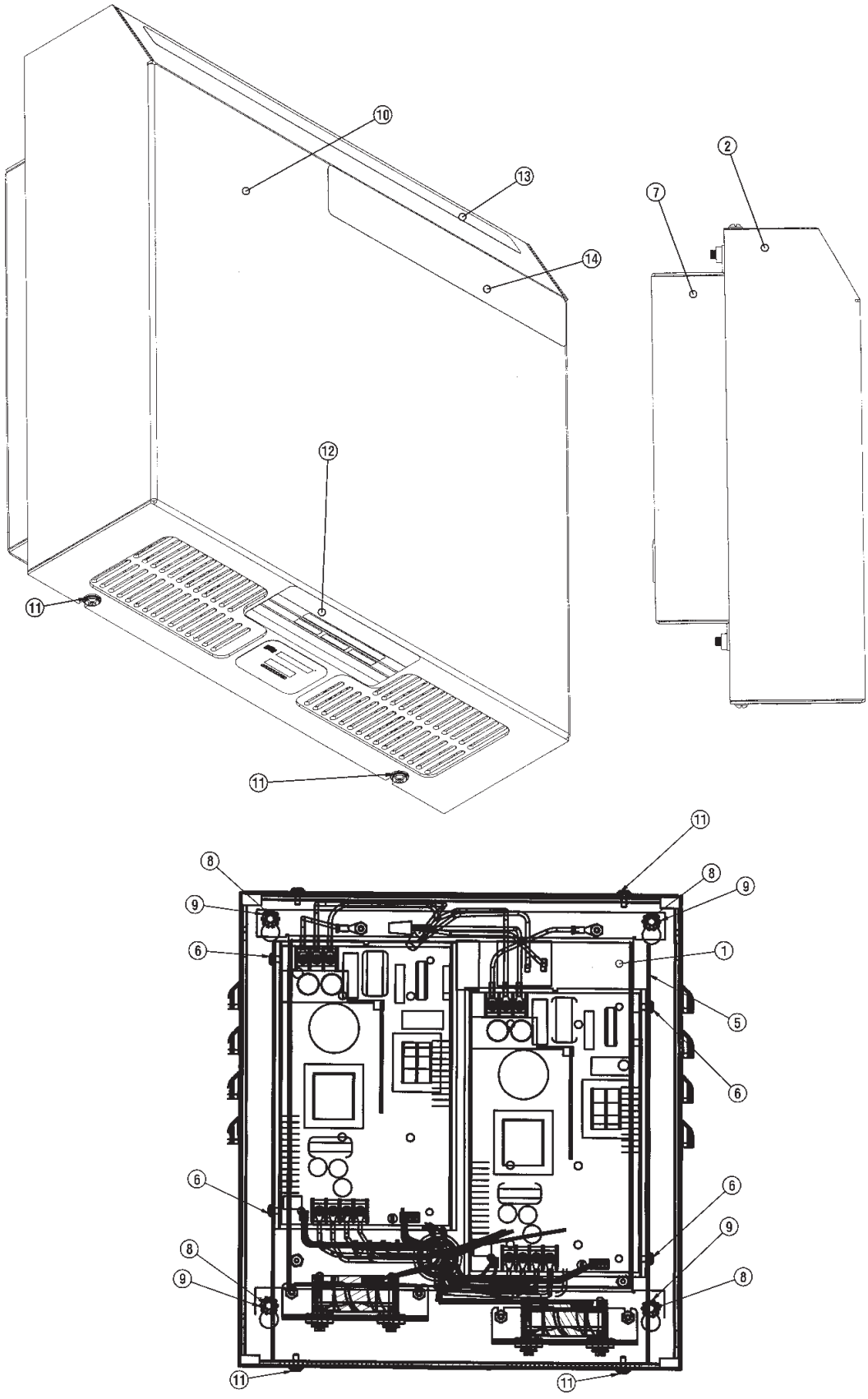


Figure 9-10. Remote Power Module Assembly

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-10- 1	P	146667	295		REMOTE POWER MODULE ASSEMBLY –SINGLE	X			
	P	146667	290		REMOTE POWER MODULE ASSEMBLY –DUAL		X		
2	P	146667	296		PANEL ASSEMBLY, RPM, Single (See Figure 9-11)	1			
	P	146667	291		PANEL ASSEMBLY, RPM, Dual (See Figure 9-11)		1		
3	P	146667	186		STANDARD PACKAGING, Control Center (Not Shown)	1	1		
4	P	146667	112	*	ASSEMBLY, Rough-in Box (Not Shown) (See Figure 9-9A)	–	–	X	
5	P	136820	296		AIR DUCT, RPM	1	1		
6	P	093908	040		SCREW, Philips Head, #8-32 x 1/4 Lg	4	4		
7	P	146667	286		SHIPPING BRACKET ASSEMBLY	1	1		
8	P	042631	045		SCREW, Socket Button Head, 1/4-20	4	4		
9	P	076230	091		WASHER, Lock (Ext. Tooth), 1/4	4	4		
10	P	146667	293		COVER, RPM, w/o Labels	1	1		
11	P	129362	383		SCREW, Pan Head, w/Washer, #6-32 x 3/8 Lg	4	4		
12					LABEL, Serial No./Data (Reference Only)	1	1		
13	P	093926	319		LABEL, Warning (Electric Shock Hazard)	1	1		
14	P	093926	324		LABEL, Product ID	1	1		

*Item #4 is not included with the Remote Power Module Assembly

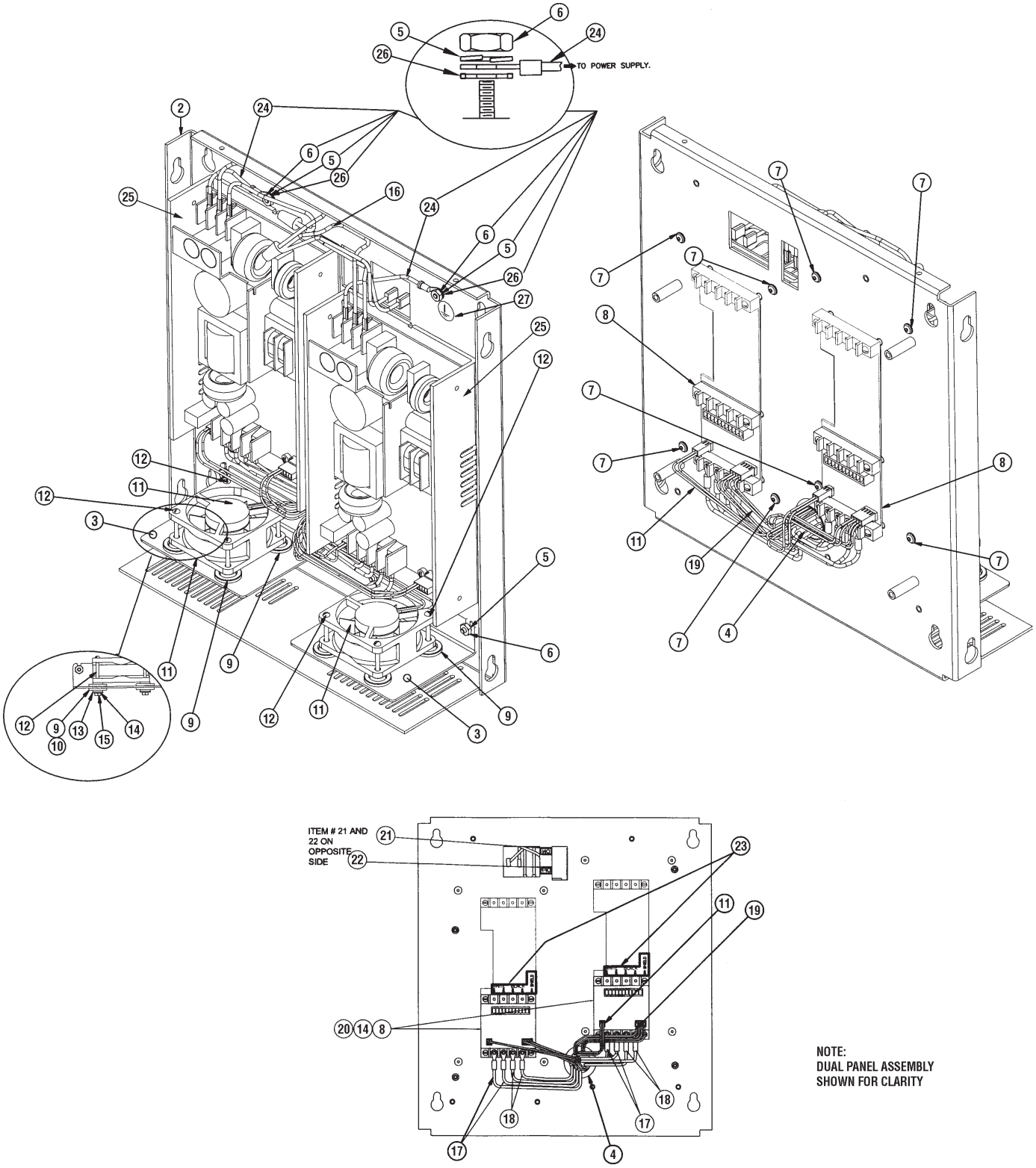


Figure 9-11. Remote Power Module - Panel Assembly

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-11- 1	P	146667	296		RPM PANEL ASSEMBLY – SINGLE	X			
	P	146667	291		RPM PANEL ASSEMBLY – DUAL		X		
2	P	146667	294		SUBPANEL ASSEMBLY	1	1		
3	P	136820	293		BRACKET, Fan	1	2		
4	P	024582	091		GROMMET	1	1		
5	P	019684	061		WASHER, Lock, #6	4	8		
6	P	118432	061		NUT, Hex, #6-32	4	8		
7	P	049541	042		SCREW, Button Head, #8-32	4	8		
8	P	136820	101		PC BOARD, Standard Power/Status	1	2		
9	P	093926	062		GROMMET, Isolator Rubber	4	8		
10	P	129382	413		SPACER, Nylon	4	8		
11	P	093926	023		CABLE FAN ASSEMBLY	1	2		
12	P	129382	370		SCREW, #4-40 x 1.5 Lg	4	8		
13	P	129382	371		WASHER, Flat, #4	4	8		
14	P	084116	001		WASHER, Lock, #4	8	16		
15	P	081671	009		NUT, Hex, #4-40	4	8		
16	P	136820	294		WIRING HARNESS, Single	1	–		
	P	136820	286		WIRING HARNESS, Dual	–	1		
17	P	093926	334		POWER CABLE, 24V (Red)	2	4		
18	P	093926	335		POWER CABLE, 24V (Blue)	2	4		
19	P	093926	336		CABLE, Fan Monitor	1	2		
20	P	129362	208		SCREW, #4-40 x 3/4 Lg	4	8		
21	P	129382	348		LABEL, On	1	1		
22	P	129382	349		LABEL, Off	1	1		
23	P	129382	424		LABEL, Power Status Wiring	1	2		
24	P	093926	337		CABLE, A.C. Power (Short Green)	1	2		
25	P	093926	053		POWER SUPPLY	1	2		
26	P	091146	061		WASHER, Lock, Ext. Tooth	1	2		
27	P	129360	483		STICKER, Natural Ground	1	2		
28	P	150476	930		MOUNTING BASE (Not Shown)	A/R	A/R		
29	P	084104	001		WIRE TIE (Not Shown)	A/R	A/R		

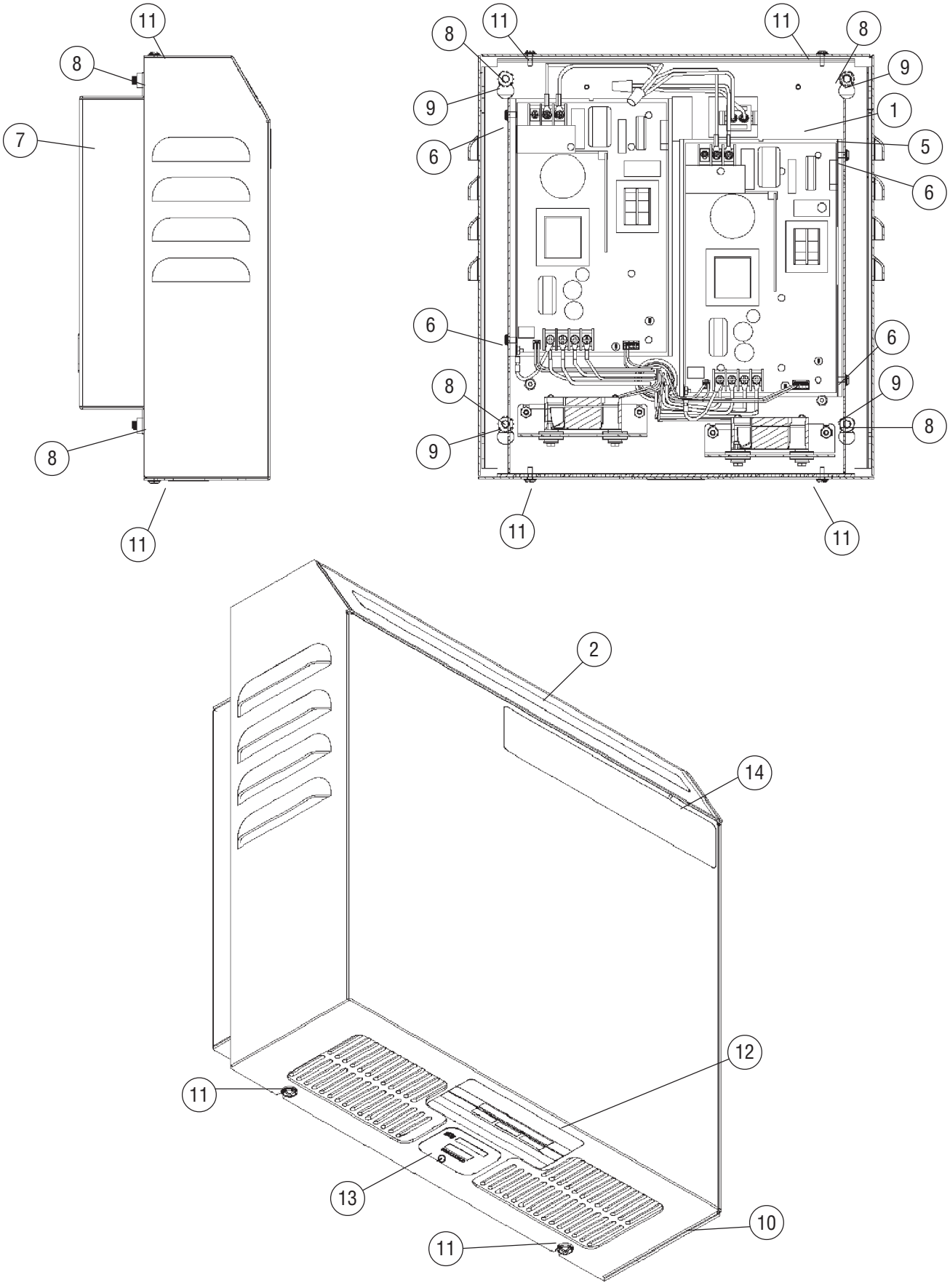


Figure 9-12. Remote Power Module Assembly with Auto Change Over (Global)

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-12-	P	146667	329		REMOTE POWER MODULE ASSEMBLY WITH AUTO CHANGE OVER (DUAL) (GLOBAL)	X			
	P	146667	328		REMOTE POWER MODULE ASSEMBLY WITH AUTO CHANGE OVER (SINGLE) (GLOBAL)		X		
1	P	146667	232		PANEL, RPM (Dual) Back-Up Power Status Assembly	1	–		
	P	146667	331		PANEL, RPM (Single) Back-Up Power Status Assembly	–	1		
2	P	093926	319		LABEL, Warning (Electric Shock Hazard)	1	1		
3	P	146667	186		PACKAGING, Control Center Standard (Not Shown)	1	1		
4	P	146667	225		ASSEMBLY, Rough-In Box (Not Shown)				
5	P	136820	296		DUCT, RPM Air	1	1		
6	P	093908	040		SCREW, Phillips Head SEMS, #8-32 x 1/4" Lg.	4	4		
7	P	146667	286		ASSEMBLY, Shipping Bracket	1	1		
8	P	042631	045		SCREW, Socket Button Head, 1/4-20	4	4		
9	P	076230	091		WASHER, External Tooth Lock, 1/4"	4	4		
10	P	146667	293		COVER, RPM	1	1		
11	P	129362	383		SCREW, Pan Head w/Washer, #6-32 x 3/8" Lg.	4	4		
12	P	129362	378		LABEL, Serial No./Data	1	1		
13	P	150828	999		LABEL, Barcode (Service)	1	1		
14	P	093926	324		LABEL, Product ID	1	1		

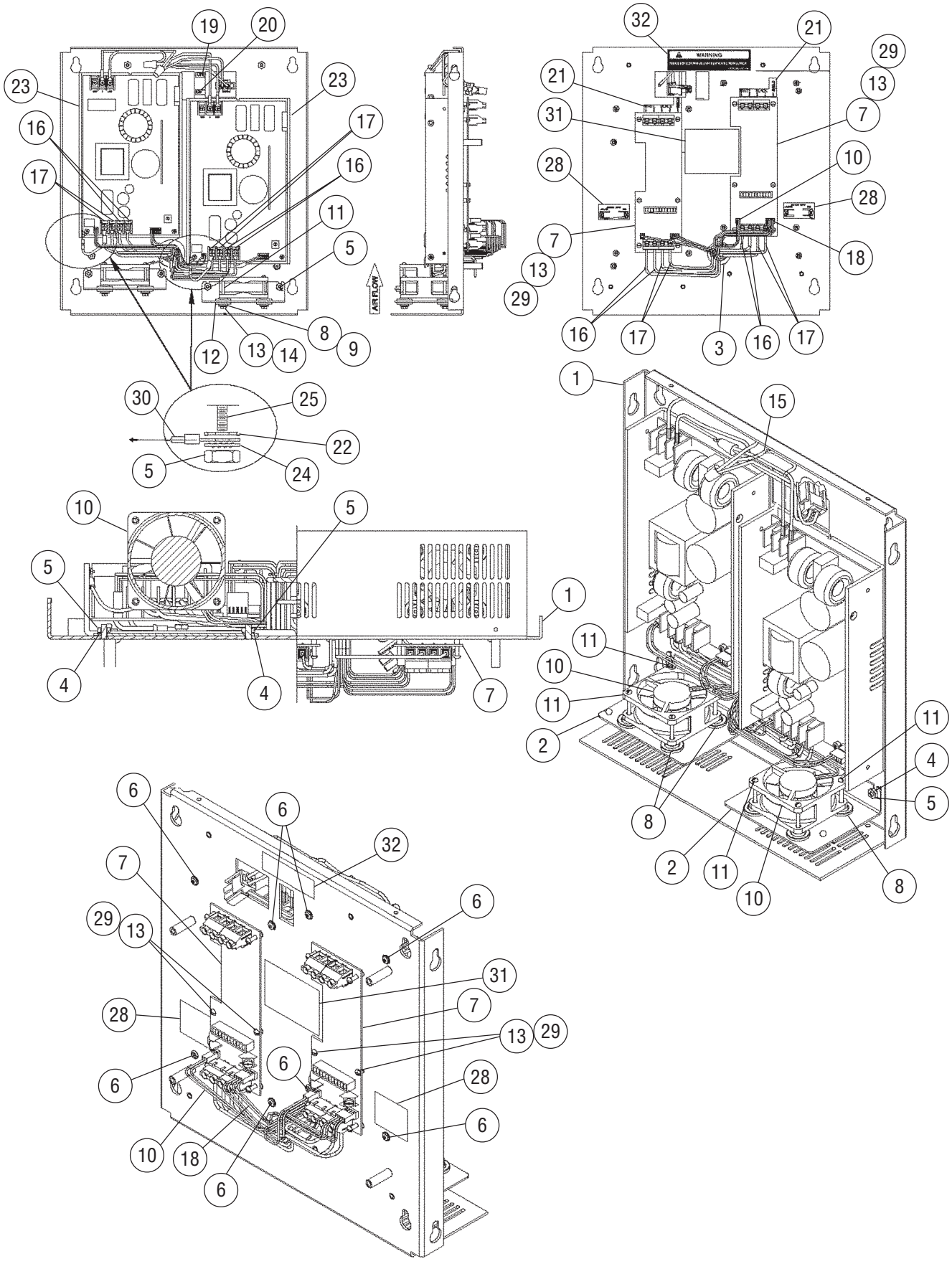


Figure 9-13. Remote Power Module Back-Up Power Status Assembly Panel (Global)

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-13-	P	146667	232		REMOTE POWER MODULE BACK-UP POWER STATUS ASSEMBLY PANEL (DUAL) (GLOBAL)	X			
	P	146667	331		REMOTE POWER MODULE BACK-UP POWER STATUS ASSEMBLY PANEL (SINGLE) (GLOBAL)		X		
1	P	146667	294		ASSEMBLY, Sub-Panel	1	1		
2	P	136820	293		BRACKET, Fan	2	1		
3	P	024582	091		GROMMET	1	1		
4	P	019684	061		WASHER, Lock, #6	6	2		
5	P	118432	061		NUT, Hex, #6-32	6	3		
6	P	049541	042		SCREW, Button Head, #6-32	8	6		
7	P	136820	103		BOARD, Back-Up Power/Status PC	2	1		
8	P	093926	062		GROMMET, Isolator Rubber	8	4		
9	P	129382	413		SPACER, Nylon	8	4		
10	P	093926	023		ASSEMBLY, Cable Fan	2	1		
11	P	129382	370		SCREW, #4-40 x 1.5" Lg.	8	4		
12	P	129382	371		WASHER, Flat, #4	8	4		
13	P	084226	001		WASHER, Lock, #4	20	10		
14	P	081671	009		NUT, Hex, #4-40	8	4		
15	P	136829	311		ASSEMBLY, Wiring Harness	1	–		
	P	136829	312		ASSEMBLY, Wiring Harness	–	1		
16	P	093926	334		CABLE, Power, 24V (Red)	4	2		
17	P	093926	335		CABLE, Power, 24V (Blue)	4	2		
18	P	093926	336		CABLE, Fan Monitor	2	1		
19	P	129382	348		LABEL, ON	1	1		
20	P	129382	349		LABEL, OFF	1	1		
21	P	129382	424		LABEL, Power Status Wiring	2	1		
22	P	081683	001		WASHER, External Lock (Steel)	2	1		
23	P	093926	361		SUPPLY, Power	2	1		
24	P	018131	091		WASHER, Internal Lock (Steel)	2	1		
25	P	084119	002		SCREW, Flat Countersink Slotted Head (Steel), #6-32 x 3/8" Lg.	2	1		
26	P	150476	930		BASE, Mounting (Not Shown)	4	2		
27	P	084104	001		TIE, Wire (Not Shown)	4	1		
28	P	129382	581		LABEL, Battery Input	2	1		
29	P	081681	006		SCREW, Round Head, #4-40 X 1/4 Lg.	12	6		
30	P	093926	337		CABLE, AC Power (Short Green)	2	1		
31	P	129382	686		CABLE, Connection	1	1		
32	P	129382	684		LABEL, Warning, (Wiring Change)	1	1		
33	P	093926	339		BRACKET, Air Duct Mounting (RPM) (Not Shown)	–	1		

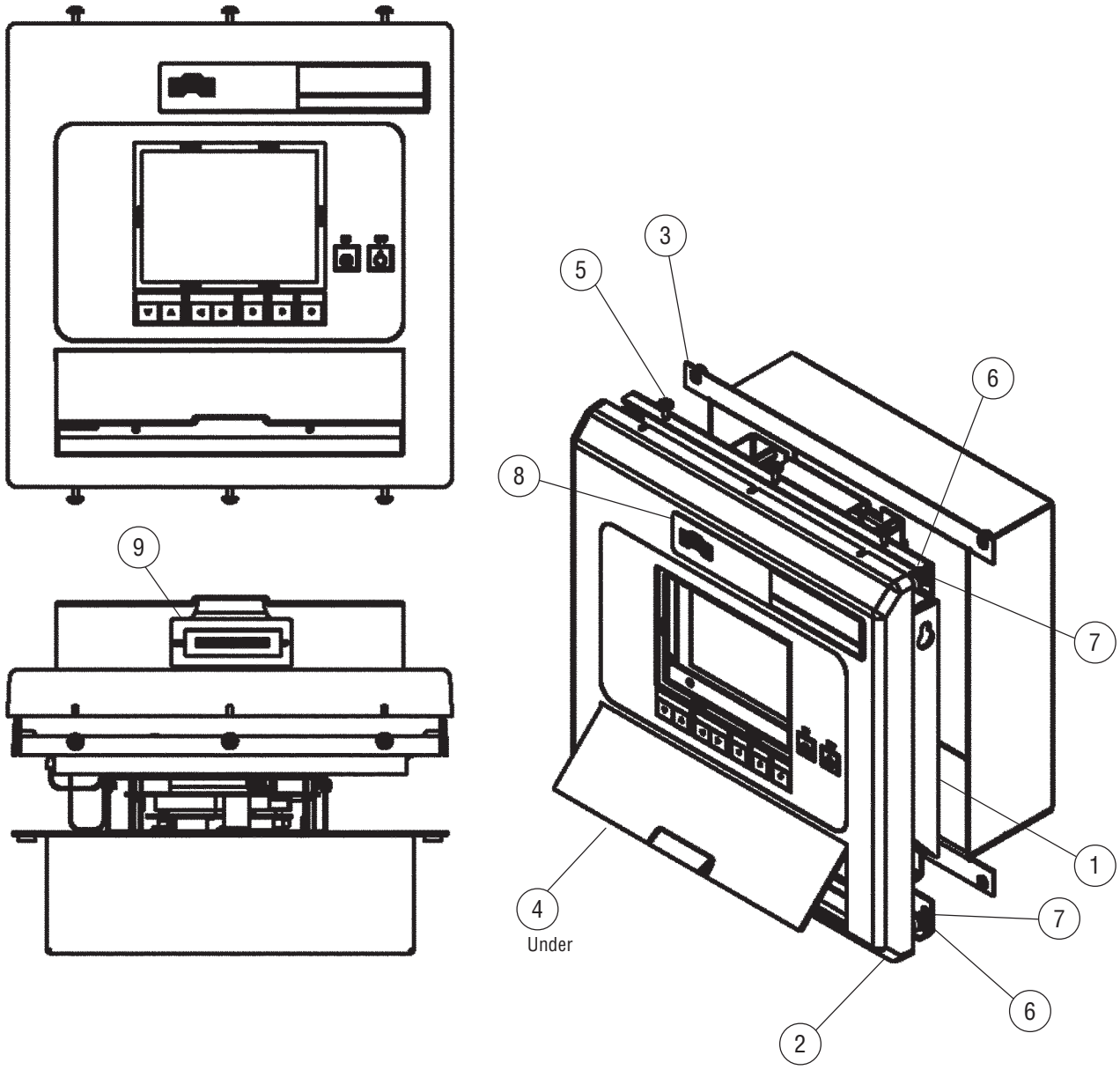


Figure 9-14. Low Profile Control Assembly

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY
9-14-	P	146667	322		LOW PROFILE CONTROL ASSEMBLY	X
1	P	146667	319		ASSEMBLY, Panel & Components	1
2	P	146667	300		COVER/MEMBRANE	1
3	P	146667	286		ASSEMBLY, Shipping Bracket	1
4	P	150828	999		LABEL, Service	1
5	P	129362	383		SCREW, Pan Head, w/Lock Washer, #6-32 x 3/8" Lg.	6
6	P	076230	091		WASHER, External Lock	4
7	P	042631	045		SCREW, Button Head, 1/4-20	4
8	P	093926	324		LABEL, Harmony LA Product ID	1
9	P	129378	027		LABEL, Serial Number	1

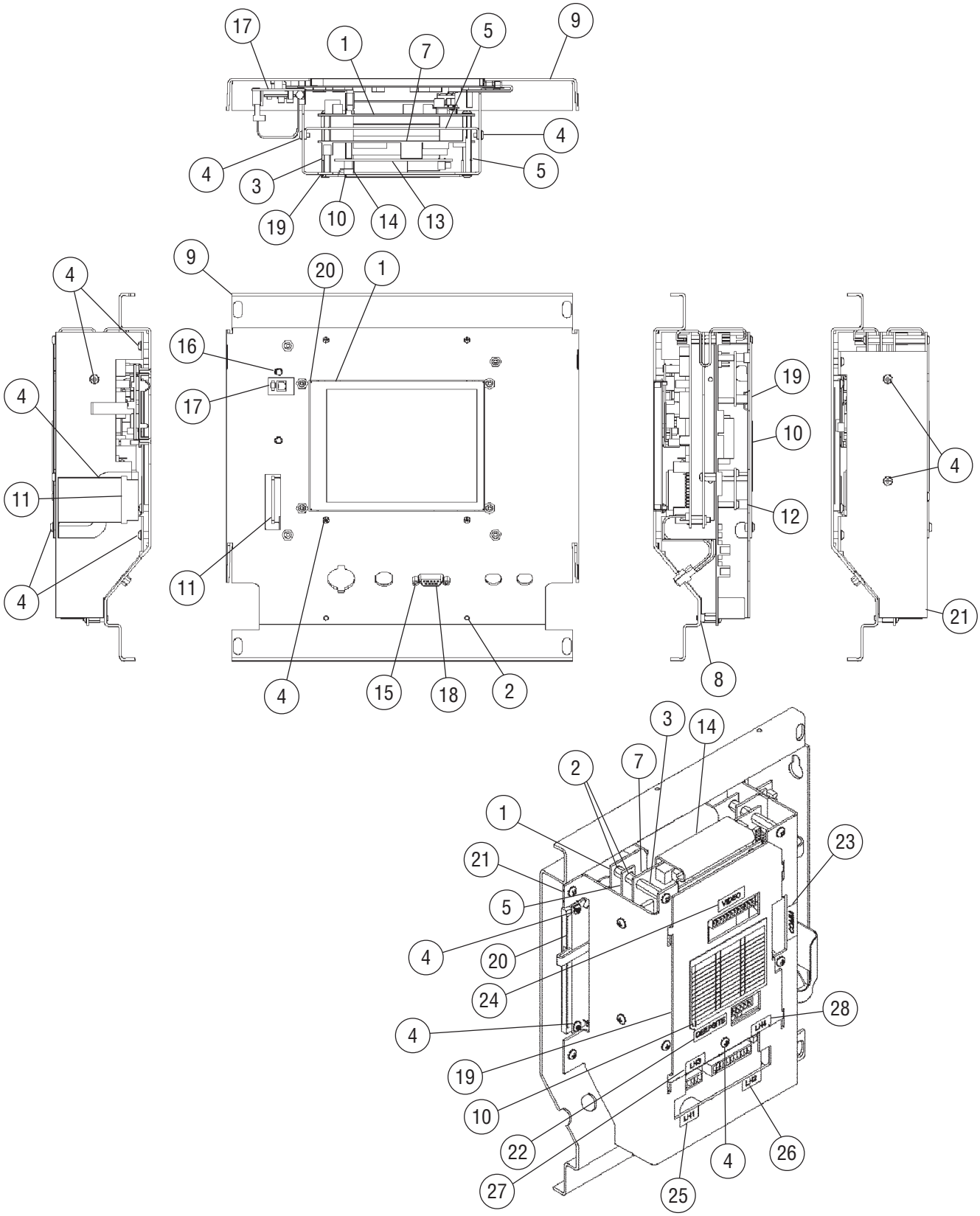


Figure 9-15. Panel & Component Assembly (Low Profile)

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-15-	P	146667	319		PANEL & COMPONENT ASSEMBLY (LOW PROFILE)		X		
1	P	146667	104		BOARD, LCD Interface, w/Voice & IR	1			
2	P	129382	508		STANDOFF, Hex, 1/4"	10			
3	P	129382	512		SPACER	4			
4	P	093908	033		SCREW, w/Lock Washer, #6-32 x 1/4" Lg.	24			
5	P	136820	230		ASSEMBLY, PCB Mounting Plate	1			
6	P	084104	001		TIE, Cable (Not Shown)	2			
7	P	146667	101		ASSEMBLY, Master Control Board	1			
8	P	129382	513		SPACER, #6 x 1/8" Thick	2			
9	P	146667	321		ASSEMBLY, Panel/Pem Nut	1			
10	P	129382	687		LABEL, Connector	1			
11	P	136820	285		ASSEMBLY, Keypad LCD Cable	1			
12	P	136820	109		BOARD, DeepSite Interface	–			
13	P	136820	107		BOARD, Video	–			
14	P	093926	038		ASSEMBLY, Control LCD Cable	1			
15	P	129380	078		KIT, Stand-Off	1			
16	P	129382	514		SCREW, Countersink Head, #4-40 x 3/8"	–			
17	P	129378	100		IR PCB	–			
18	P	093926	039		ASSEMBLY, Service Interface Cable	1			
19	P	136820	299		COVER, Access	1			
20	P	136820	021		MODULE, LCD	1			
21	P	136820	228		ASSEMBLY, PCD Bracket	1			
22	P	129382	333		LABEL, DeepSite	1			
23	P	129382	334		LABEL, Comm	1			
24	P	129382	335		LABEL, Video	1			
25	P	129382	420		LABEL, LH1	1			
26	P	129382	421		LABEL, LH2	1			
27	P	129382	422		LABEL, LH3	1			
28	P	129382	423		LABEL, LH4	1			

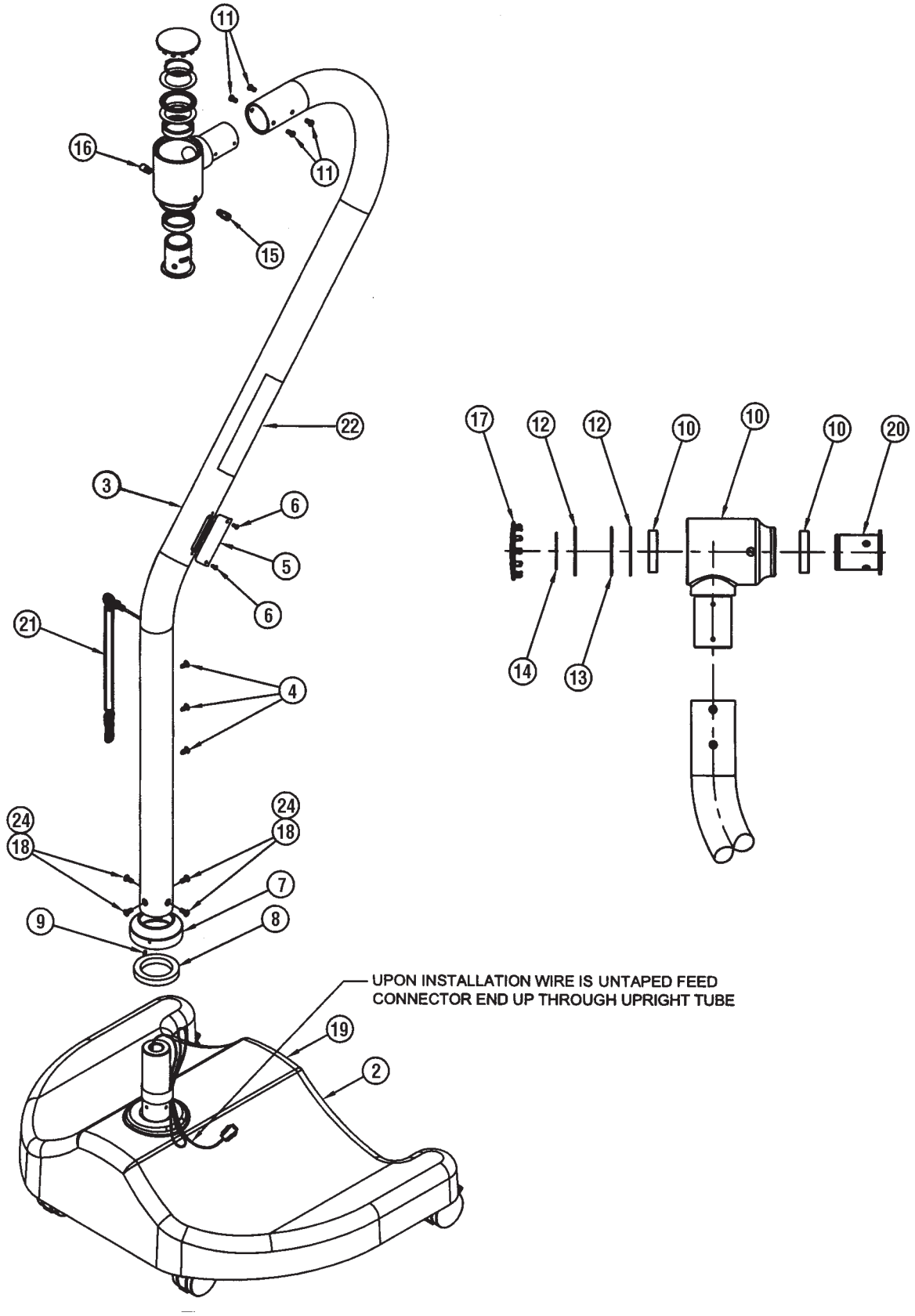


Figure 9-16. Harmony LA 500 Mobile Stand Assembly

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY
9-16- 1	P	146667	210		HARMONY LA 500 MOBILE STAND ASSEMBLY	X
2	P	146667	212		BASE ASSEMBLY (See Figure 9-17)	1
3	P	146667	203		TUBE, Upright	1
4	P	056938	790		KEY HOLE CLIP, Nylon	3
5	P	093926	257		COVER, Slot	1
6	P	129382	263		SCREW, Pan Head, SS, #8-32 x .250 Lg	2
7	P	093926	254		COLLAR	1
8	P	093926	258		SEAL RING	1
9	P	124351	024		SCREW, Set Socket, SS, #10-32 x .375	2
10	P	755717	357		ADAPTER ASSEMBLY, w/Bearings	1
11	P	129382	264		SCREW, Button Head, SS, .250-28 x .500 Lg	4
12	P	129382	254		WASHER, Thrust, 2.00 ID x 2.75 OD	2
13	P	129382	255		BEARING, Thrust, 2.00 Bore x 2.75 OD	1
14	P	129382	257		RING, Retaining, 2"	1
15	P	129382	256		SCREW, Set	1
16	P	129359	087		BRAKE	1
17	P	129382	259		PLUG BUTTON, 3.313 OD	1
18	P	150823	001		SCREW, Flat Head, .250-20 x .625 Lg	4
19					NAMEPLATE, Serial No./Data (Reference Only)	1
20	P	136820	212		COLLAR, Spring Arm	1
21	P	093926	273		SAFETY CHAIN ASSEMBLY	1
22	P	093926	270		LABEL, Warning/Caution	1
23	P	129377	290		LOCTITE, 242 Pouch (Not Shown)	1
24	R	005300	554		LOCTITE, 242 (Not Shown)	A/R

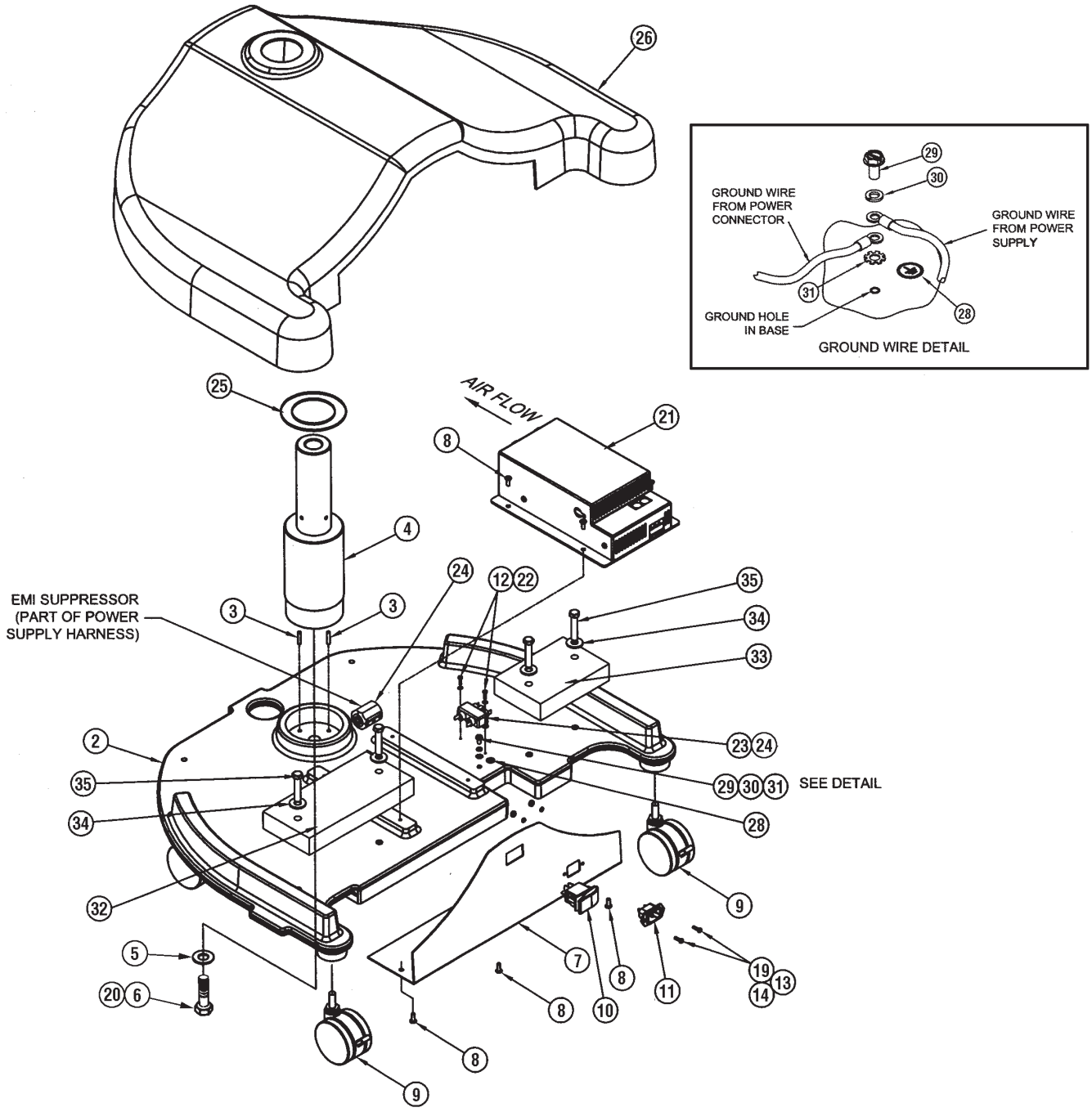


Figure 9-17. Mobile Stand Base Assembly

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
9-17- 1	P	146667	212		MOBILE STAND BASE ASSEMBLY	X			
2	P	146667	204		BASE	1			
3	P	129382	260		PIN, Dowel	2			
4	P	136820	204		STUB TUBE	1			
5	P	082396	001		WASHER, Flat, SS, .668 ID x 1.292 OD	1			
6	P	129382	265		SCREW, Hex Head, .625-11 x 2.00 Lg	1			
7	P	136820	214		PANEL, Electrical	1			
8	P	129380	076		SCREW, Pan Head, SS, #10-32 x .500	7			
9	P	093926	255		CASTER, w/Lock, 2.95 OD w/.375-16 Stud	4			
10	P	093926	261		SWITCH, Rocker	1			
11	P	093926	260		CONNECTOR, Power Cord	1			
12	P	129382	262		SCREW, Pan Head, SS, #6-32 x .500	2			
13	P	118432	061		NUT, Hex, SS, #6-32	2			
14	P	019684	061		WASHER, Lock, #6	2			
15	P	129382	287		KIT, Power Cord (Not Shown)		X		
16	P	056397	367		• CORD, Cable Tie, Velcro (Not Shown)		1		
17	P	084104	001		• CABLE TIE, 4" (Not Shown)		1		
18	P	764324	271		• CORD ASSEMBLY (Not Shown)		1		
19	P	129377	553		SCREW, Flat Head, SS, #6-32 x .500	2			
20	R	005300	548		LOCTITE, 271	A/R			
21	P	136820	220		POWER SUPPLY	1			
22	P	091146	061		WASHER, Lock, #6, Ext. Tooth	2			
23	P	093926	309		FILTER AC LINE	1			
24	R	005300	006		ADHESIVE, White, RTV-162	A/R			
25	P	093926	274		GASKET COVER	1			
26	P	146667	201		COVER, Base	1			
27	P	084104	001		CABLE TIE, 4" (Not Shown)	3			
28	P	129360	483		LABEL, Natural Ground	1			
29	P	082675	001		SCREW, Ground, #10-32 x .375 Green	1			
30	P	019677	041		WASHER, Lock, #10, Helical Spring, SS	1			
31	P	124361	013		WASHER, Lock, #10, Ext Tooth, SS	1			
32	P	093926	271		COUNTERWEIGHT, 12.75 Lbs	1			
33	P	093926	272		COUNTERWEIGHT, 8.5 Lbs	1			
34	P	017263	042		WASHER, Flat, .375	4			
35	P	129360	278		SCREW, Cap, .375-16 x 1.75	4			

Endoscopy Video Connector Kits -
These are various video connection kits, used for interfacing the Harmony LA suspension system wiring to the major endoscopy companies equipment. Each kit includes a hub interface connector kit (for ceiling connections) , instructions, and a yoke/monitor connection (for monitor connection).

Endoscopy Video System Integrator	Smith & Nephew	Smith & Nephew Reed	Stryker	Karl Storz	Reed Productions
Equip Number	**LB00-000-200**	**LB00-000-300**	**LB00-000-400**	**LB00-000-500**	**LB00-000-600**
KIT	136820-069	136820-070	136820-071	136820-072	136820-073
Instructions	129382-434	129382-435	129382-436	129382-437	129382-441
HUB Harness	136820-188	136820-186	136820-189*	136820-191	136820-193
Yoke Harness	136820-187	136820-187	136820-190*	136820-192	136820-194
S-Video Cable	093926-212 (2)	093926-212 (1)	093926-212	093926-212 (2)	093926-212 (1)
S-Video Cable w/ Female S-Video			093926-245		
Composite Video Cable	093926-209 (2)	093926-209 (4)	093926-209	093926-209 (2)	093926-209 (4)
Composite Video Cable w/Female BNC			093926-246		
S-Video Adapter	129382-440	129382-440	129382-440	129382-440	129382-440

Figure 9-18A. Custom Cable Kits (Table)

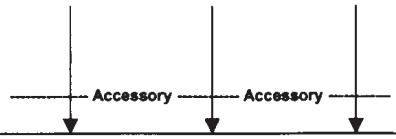
Power Connector Kits -
Various power connector kits. Used for connecting Flat Panel Monitors to DC supply voltage. Must be ordered separately from connector kits above. CRT monitors do not require power connector kits. Each kit contains the "Teflon block strain relief" where the wire exits the yoke.

Monitor Type	National Display Vector I 15"	National Display Vector I 18"	National Display Vector II and Vector III, 12VDC	National Display Vector III, 24VDC	Samsung	SONY / NEC IEC320F, 120VAC	Planar17.4" 12VDC
Equip Number	**LB00-003-000**	**LB00-003-100**	**LB00-003-300**	**LB00-003-400**	**LB00-003-500**	**LB00-003-200**	**LB00-003-600**
KIT	136820-041	136820-044	136820-068	136820-075	136820-197	093926-215	136820-257
Instructions	129382-446	129382-445	129382-433	129382-443	129382-447	129382-460	129382-479
Power Cord, Modified	093926-216	093926-216	093926-216	093926-216	093926-216		093926-216
Hub Harness	136820-040	136820-043	093926-227	093926-229	093926-230		093926-234
Yoke Harness	136820-039	136820-042	093926-226	093926-228	093926-231	093926-214	093926-235
Tubing 48" Expandable	093926-225	093926-225	093926-225	093926-225	093926-225	093926-225	093926-225
Cable Mounting Assembly	093926-204	093926-204	093926-204	093926-204	093926-204	093926-204	093926-204
M3-0.5 x 16 mm Phillips Head Screw	129382-432	129382-432	129382-432	129382-432	129382-432	129382-432	129382-432
Poly Bag	150824-259	150824-259	150824-259	150824-259	150824-259	150824-259	150824-259
Wire Nut	129382-438	129382-438	129382-438	129382-438	129382-438	129382-438	129382-438
Cable Tie	129382-444	129382-444	129382-444	129382-444	129382-444		129382-444
Earth Ground Cable							093926-247

Figure 9-18B. Custom Cable Kits (Table)

Generic Video Connector Kits -
Same principle as above, but more generic in application. Used for connecting to various monitors and above ceiling video systems that are supplied by the customer , and not from a major endoscopy company.

	VGA, No Signal, HD15M at HUB	VGA, No Signal, BNC at HUB	5-Coax VGA, No Signal, HD15M at HUB	5-Coax VGA, No Signal, BNC at HUB	5-Coax RGB(HV), No Signal, BNC at HUB and Yoke	S-Video	Composite
Equip Number	**LB00-000-100**	**LB00-001-200**	**LB00-003-700**	**LB00-003-800**	**LB00-003-900**	**LB00-001-100**	**LB00-001-000**
KIT	136820-061	136820-074	136820-262	136820-263	136820-303	129382-455	129382-454
Instructions	129382-449	129382-442	129382-483	129382-484	129382-493	129382-457	129382-456
HUB Harness	136820-198	136820-196	136820-261	136820-260	136820-302	093926-212	093926-209
Yoke Harness	136820-195	136820-195	136820-259	136820-259	136820-307	093926-212	093926-209



Hub Extender Cable -
Used in operating rooms where two center mounts are controlled by a single wall control system. Allows the communication cable that exits the center mount to be extended, connecting the satellite center mount to the hub interface board on the main center mount. Cable is plenum rated, 24 foot.

Equip Number, Accessory KIT			**LB00-###-###**	**LB00-###-###**	**LB00-###-###**
Kit, RS-232/Signal Harness Accessory			136820-306	136820-306	136820-306
Instuctions			129382-494	129382-494	129382-494
HUB Harness			136820-305	136820-305	136820-305
Yoke Harness			136820-304	136820-304	136820-304

Figure 9-18C. Custom Cable Kits (Table)